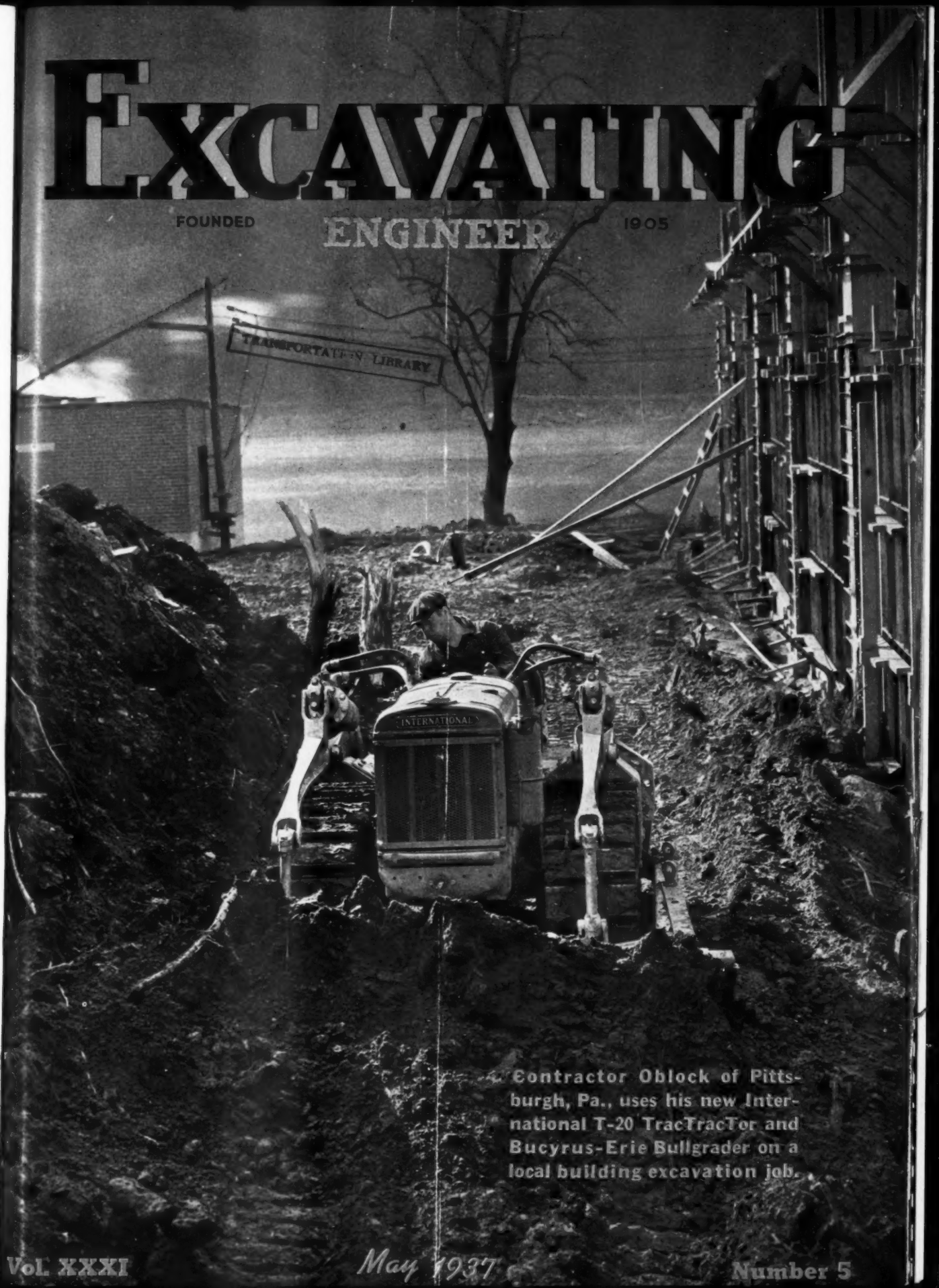
EXCAVATING ENGINEER

FOUNDED 1905



Contractor Oblock of Pittsburgh, Pa., uses his new International T-20 TracTracTor and Bucyrus-Erie Bullgrader on a local building excavation job.

Vol. XXXI May 1937 Number 5

BEVERLY IMPROVEMENT MOVES THE *Mountain* TO *Mahomet*

Only Cletrac Has the Advantages of Controlled Differential Steering

Full traction and power on both tracks when turning. Tractor turns in shorter radius with maximum load. All steering mechanism works in one common bath of oil. Simpler—safer operation...Easier control...lower maintenance cost.

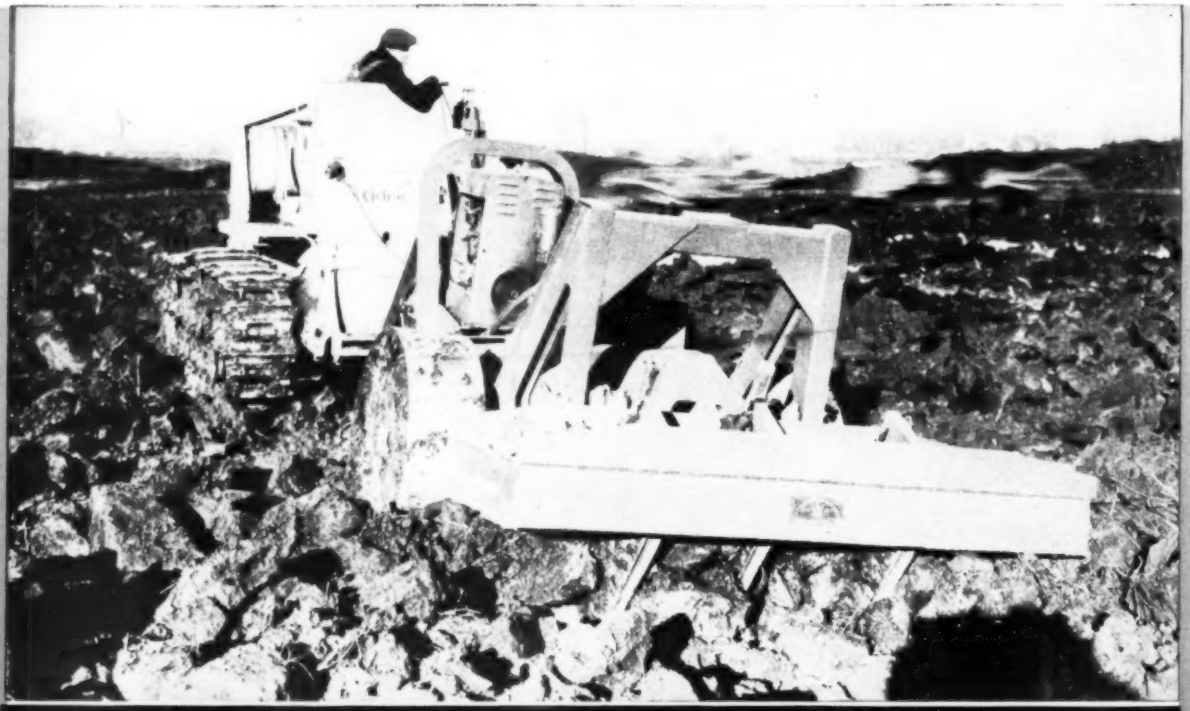
• Sand along Chicago's lake front will not support the beautiful parks the city is building. But the tons of black soil in the hinterland will — so the Beverly Improvement Company is hauling this rich black land to Chicago's West End Parks.

First a giant ripper, drawn by a Cletrac goes over the ground, followed by diesel Cletracs and five yard scrapers which strip the soil, carrying it to the dumps.

From the dump a steady stream of trucks transport the earth to the parks to become a foundation for beauty.

Hour after hour—day after day—in tough gumbo—sand — rocky and stumpy soil — Cletracs have the power and maneuverability to outperform on low cost earth moving. In Cletracs you have your choice, too, of either gasoline or diesel power — you can select the power that will suit *you* best.

THE CLEVELAND TRACTOR CO. • Cleveland, Ohio



CLETRAC CRAWLER TRACTORS

EXCAVATING

c o n t e n t s

Vol. XXXI May, 1937 No. 5

Building! . . . . . **Front Cover**

Returning prosperity has meant increase in construction, and that has meant more work of the type illustrated for contractors.

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Al Johnson and LaCrosse Dredging Company handle two interesting key jobs in the Great Lakes-to-Gulf waterway program with the dredge "Calumet" and a Bucyrus-Erie 43-B.

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LOOKING AHEAD

These interesting articles will appear in an early issue of* EXCAVATING. *Watch for them.

Revolution

William Williams goes to San Sodeo with his shovels to mine placer gold. He gets mixed up in revolution and counter-revolution, and is sentenced to death. You'll be surprised.

Mosquito Control

Essex County, New Jersey, is waging a successful war against the mosquito pests, with a ¾ yard clamshell as one of their major "big guns."

BUCYRUS-ERIE

Presenting » »

TWO WHEEL

SCRAPERS

3½ and 6-Yard

STRUCK-MEASURE CAPACITY

BUCYRUS ERIE

EXCAVATING DRILLING AND MATERIAL HANDLING EQUIPMENT SOUTH MILWAUKEE, WISCONSIN, U.S.A.

● 12,000 yards of the heavy clay shown in the foreground are passing from the dredge Calumet to the disposal area every 24 hours. The crew shown here is laying an alternate discharge section.

INLAND WATERWAY

Al Johnson and La Crosse Dredging Company use hydraulic dredge and 2-yard dragline in handling two key jobs in Great Lakes-to-Gulf waterway program.

WHEN the much-talked-of water route from the Great Lakes to the Gulf is open for business, Lake Calumet in South Chicago, will be the scene of great shipping activity. Big lake boats will come in and unload their cargoes at modern docks. Cargoes will then be reloaded to river boats for shipment to the Gulf, via the Little Calumet River, the Illinois and the Mississippi.

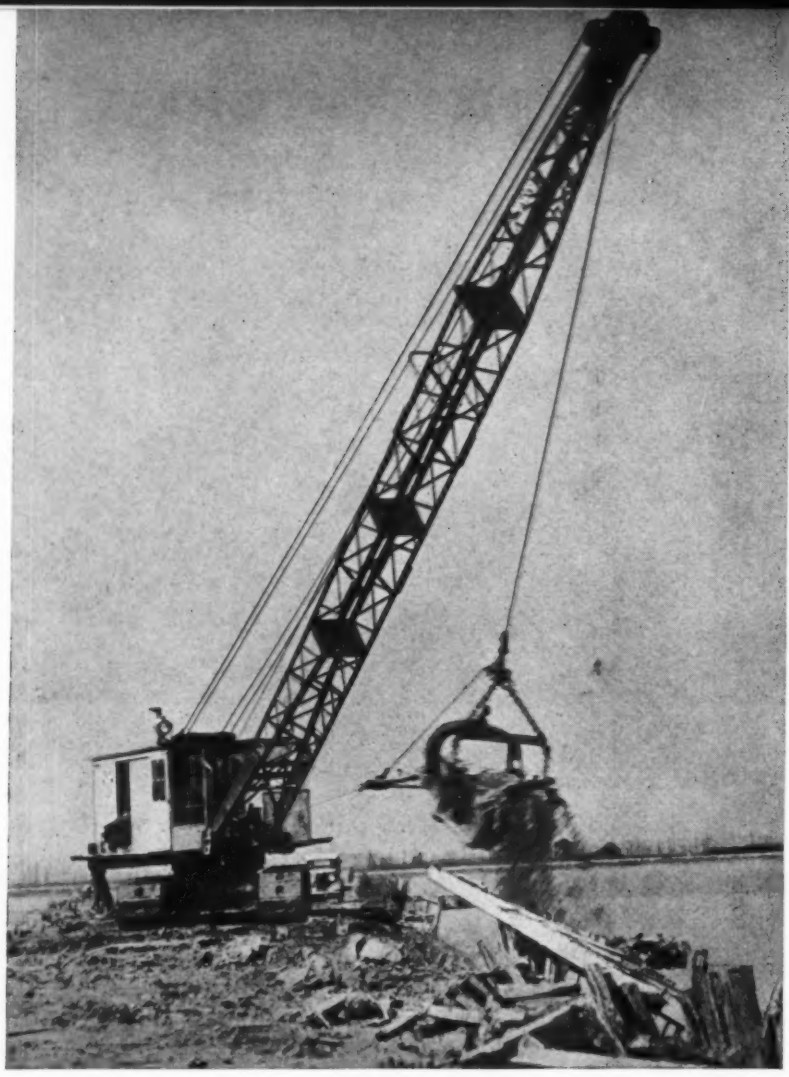
At present, Lake Calumet is a shallow marsh with only a small section of its 3 by 1 mile area having sufficient water to float any vessel larger than a duck boat. The Lake is located within 500 feet of, and connected by a slough to Turning Basin No. 5. The Turning Basin is the end of navigation for Great Lakes vessels, which makes Lake Calumet an ideal location for a modern harbor and transfer point for the Lakes and River transportation. This harbor is rapidly becoming a reality due to the operations of the dredge "Calumet," built especially for the two jobs awarded the combined Minneapolis firms, the Al Johnson Construction Company and the LaCrosse Dredging Company.

● On the opposite page: The 20-inch electric hydraulic dredge "Calumet"—believed to be the most powerful of this size in the country.

Seven Million Yards of Dredging

The first of these jobs was awarded by the Chicago office of the U. S. Engineers in November, 1935. It called for dredging a total of about 5,000,000 yards from an 8-mile section of the Calumet River between Blue Island and Lake Calumet. The channel was to be widened and straightened, and to have a finished bottom width of from 220 to 300 feet, with a depth of 11½ plus 1½ overdepth. Work on this job was started in the spring of 1936, and 3,000,000 yards had been dredged by the end of March, 1937.

The second of the Johnson-LaCrosse jobs calls for dredging about 2,160,000 yards in Lake Calumet, to provide an adequate location for terminal docks and facilities for handling cargoes for transshipment from lake boats. This job is located directly adjoining the river job, and the dredge "Calumet" will work from its present location back into the river, where it will clean up the 2,000,000 yards remaining under the first contract. The dredge cut



● Throwing up a dyke around the dredge disposal area is this Bucyrus Erie 2-yard dragline. Working on a narrow tongue of land, the rig is digging tough boulder clay from under water. Like the dredge, the dragline is worked in three eight-hour shifts daily, has stood up well under the tough going.

on this second job is 4700 feet long, and varies in width from three to 850 feet. Depth is 21 feet, with an overdepth of two feet, making a total of 23 feet being removed. Work was started on this job the 29th of March, and material is now being pumped to the disposal site at an average rate of 12,000 yards per 24-hour day.

Unusual Dredge Features

The "Calumet" is a 20-inch electric hydraulic dredge, believed to be the most powerful of this size in the country. Designed by Jean M. Allen & Company of Chicago to handle its present work, the dredge has several unusual features. For instance, because heads against which the dredge must pump vary considerably, demanding a range of impeller speeds for most efficient operation, two main motors mounted on one shaft, instead of the usual one, furnish the power for pumping. One of these motors operates at 450 r.p.m., and the other at 360 r.p.m. With two impellers, 54-inch and 59-inch diameter, four impeller rim speeds are available, permitting maximum efficiency of operation under all conditions, and pipe lengths ranging from 500 to 6000 feet.

The steel hull of the "Calumet" is 100 feet by 33 feet by 8 feet. Main motors and pump are set in a well, with hoist, cutter drive and control board placed flush with the deck. Pilot house and office of the U. S. Engineer assigned to the job are on the upper deck, and so designed that their upper part can be lifted off by derrick to provide reduced height for passing under bridges. Spud lifting frame and front lifting frame are constructed so that they can be lowered for bridge clearance without dismantling.

Power for dredge operation is purchased at 12,000 volts from the Commonwealth-Edison Company and brought to the job on an 8-mile line constructed by Johnson-LaCrosse. Current is stepped down to 4000 volts at a barge-mounted sub-station which can be moved and tapped into the line where necessary. The 4000-volt, 60-cycle current is taken from substation to dredge through 3-conductor submarine power cable terminating in a power-controlled cable reel on the back of the dredge.

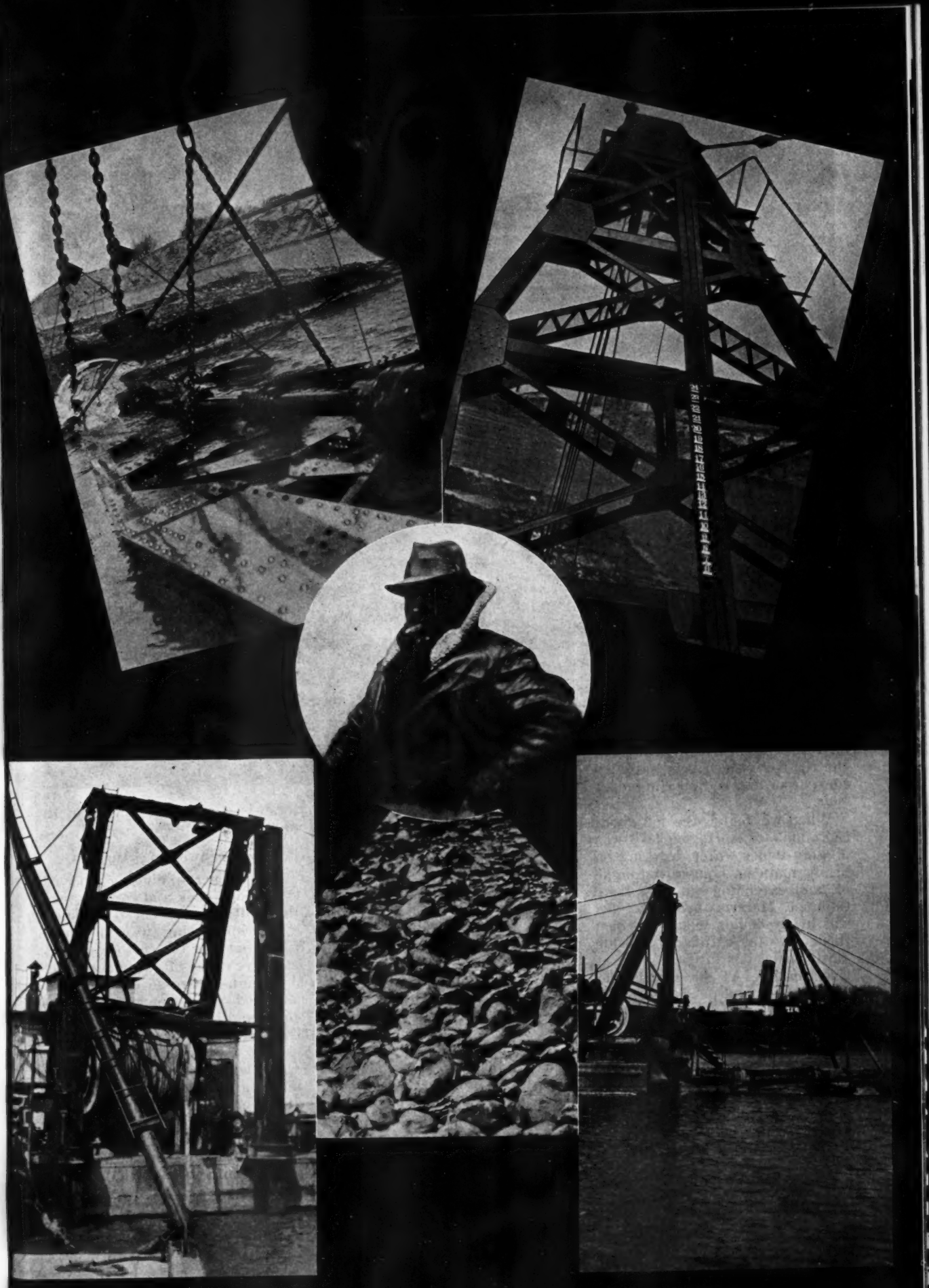
Dredge motors were designed and built by the Elliot Company. Main pump was built by Bucyrus-Erie, as were the hoist and heavy-duty cutterhead which is used in rock and hardpan. The hull was built, and machinery assembled, at the Calumet shipyard under the supervision of F. J. Veir, Johnson-LaCrosse superintendent.

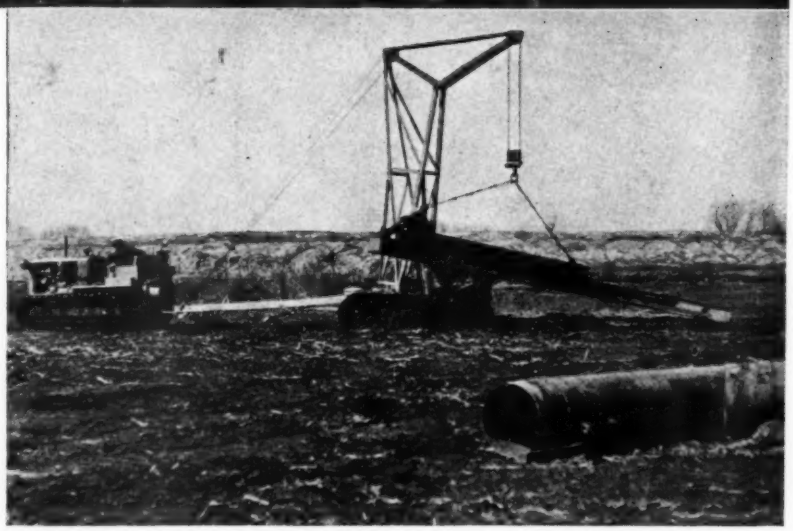
Job Problems Dictate Operating Plan

The operating method, which is the same in general for the two jobs, devised to meet conditions and problems of the work has proved highly successful and smooth-functioning.

Disposal site for dredged material has very definite limits. To prevent material from flowing back into the lake, or from covering forbidden territory, a dike is constructed around the disposal area. On the lake job, this dike is about 14,000 feet long. It is

● On the opposite page upper left is a view of the cutterhead in action. The dredge cuts out the bank in three-foot sections. Upper right is the scale which enables the operator to tell how deep he is digging. As the cutterhead moves up and down, the roller likewise moves on the scale of numbers. Superintendent Veir is shown in the center, and directly below him is a close-up of the boulder clay as it looks in the disposal area. Lower left picture shows dredge spuds and cable reel, and the connection between dredge and pontoon pipe is pictured lower right.





● One reason for the excellent performance of the dredge is undoubtedly the spick-and-span condition in which it is kept, inside and out. The picture directly at the right shows a Caterpillar RD6 and LeTourneau 10-ton crane setting one of the unique swing anchors designed by the Johnson-LacCrosse organization to withstand a pull of from 60,000 to 70,000 pounds.

thrown up by a Bucyrus-Erie 43-B dragline, equipped with a 2-yard Red Arch bucket, which was purchased specially for the work in January 1937. This machine has a 60-foot boom, and is equipped with a 6-cylinder Buda-Lanova Diesel engine. Operated on a three eight-hour shifts daily, the rig has proven very satisfactory, according to Superintendent Veir.

When we visited the job about the middle of April, the 43-B was digging under water, working on heavy mats on a narrow tongue of land extending out into Lake Calumet. Material being handled was heavy boulder clay, of which there is an estimated 60,000 yards to be put into the dike at this location. As the clay is dug under water and piled directly to the dike, accurate output figures are difficult to obtain, but the estimated average hourly output is running between 100 and 150 yards. In constructing the inner dike section, mostly of normal dirt, the dragline handled an average of 200 yards per hour.

Excess water from inside the disposal area is returned to the lake or river through two thirty-inch pipes placed under the dike at the time of construction. The intake ends of these pipes are in a heavy framed box, 6 feet by 12 feet inside measure, and the head of water inside the spoil area is controlled by adding or removing the board sides of the box. This acts as a spillway, allowing water to be drained and retaining the materials spoiled in the area.

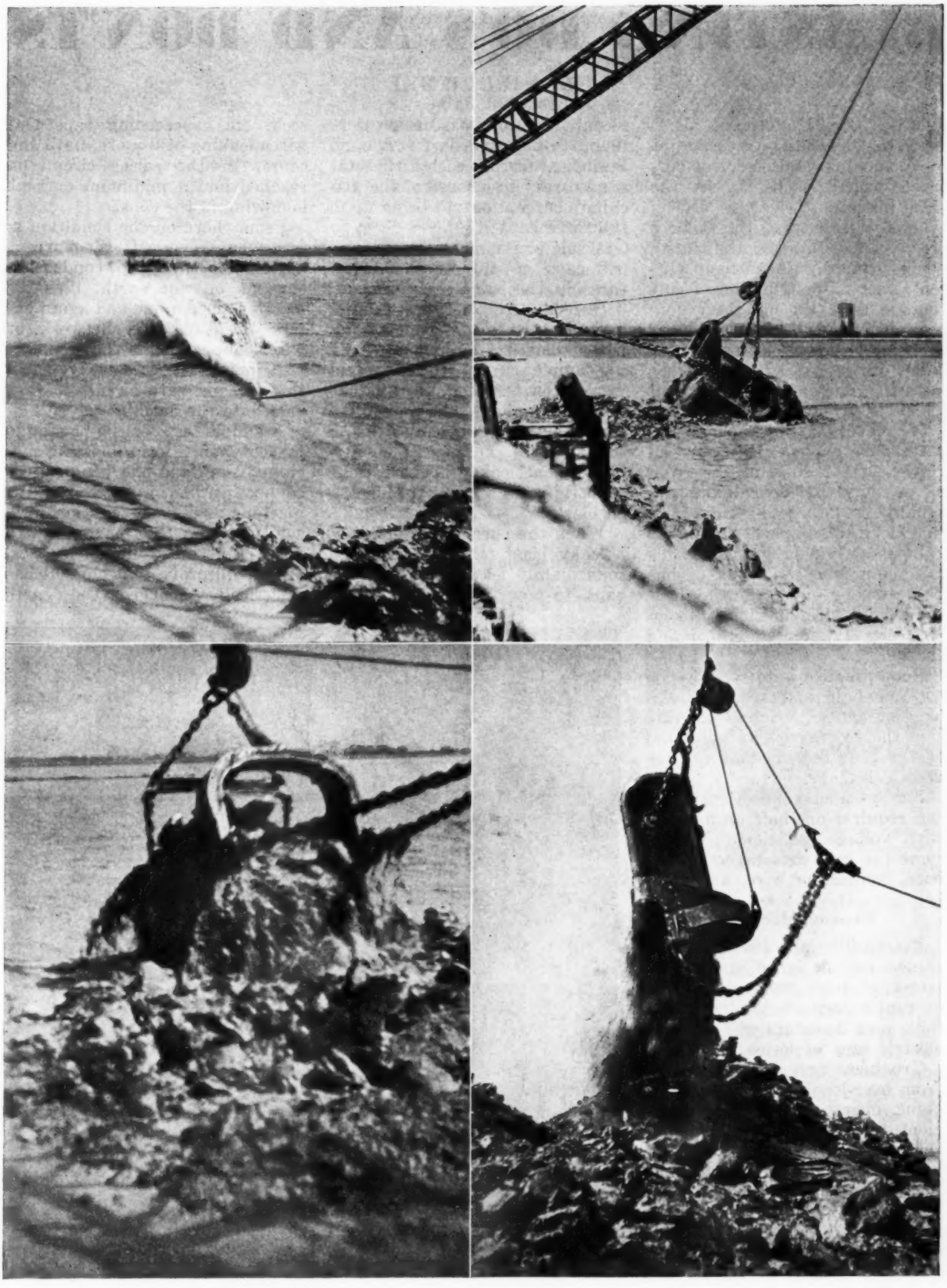
Regular land pipe, carrying material from the dredge is 20-inch diameter, was manufactured by the Lancaster Iron Works, Inc. Pontoon pipe—also of 20-inch diameter — and pontoons were made by the Graver Tank Company. Ball joint connections, between Pontoons are a product of the Mobile Pulley Works.

At present the total length of pipe line is 3100 feet. Maximum length on the job will be about 6000, with heights to which material is pumped ranging from 12 to 40 feet.

Unique Swinging Anchors

Swinging the digging end of the dredge back and forth across the width of the cut is handled in an interesting way. Because the ground is too soft to permit effective use of deadmen, the Johnson-LaCrosse organization designed some unique steel anchors and had them fabricated at the Calumet shipyard. These consist of a braced T-shaped steel frame with a steel arm, terminating in a spade-shaped section set at an angle to the main frame. The angle of the anchor is such that pull on the line leading from it to the dredge sinks the spade section into the ground. Then, when it is sunk so the frame is

(Continued on page 310)



● The 2-yard bucket hits the water . . . comes up with a load of clay . . . swings and dumps on the growing dyke.

BLASTING DO'S AND DON'TS

By PAUL ZIEMKE

SUCCESSFUL electric blasting depends on passage of an equal and sufficient current through each cap at the same instant.

Ninety per cent of the failures are electrical failures, the causes being primarily insufficient current, unequal distribution of current, leakage through bare connections, ground leakage caused by using ordinary electric caps in damp or wet work, and the use of firing current the source of which is grounded.

Whenever blasting caps misfire, yet can be exploded by a second application of current, the trouble is purely electrical and can usually be located by investigation along this line.

Investigation proves that each cap requires a minimum of one half ampere of current to heat the bridge wire sufficiently to ignite the fulminate or priming charge.

Good practice is to provide one and one-half amperes for each blasting cap or series of blasting caps thereby insuring a minimum of the required one-half ampere despite leakage.

For parallel connections each cap requires one-half an ampere, with voltage sufficient to overcome the total resistance of lead wire, connecting wire, and caps.

Blasting Machines

Practically all blasting machines are designed to furnish power at high voltage, but the current capacity is limited, therefore, such machines will only fire electric caps in series.

Troubles here usually occur from over-loading a blasting machine, operating it without sufficient force, or using a machine that through age and abuse does not deliver sufficient power. Fully fifty per cent of the machines brought in for testing during a recent tour of Wisconsin were found to be in need of servicing. Periodical testing with a rheostat is necessary to be sure of the machine's current output being up to full rated capacity.

A rule to remember is **never** to use caps of different manufactures in the same series circuit.

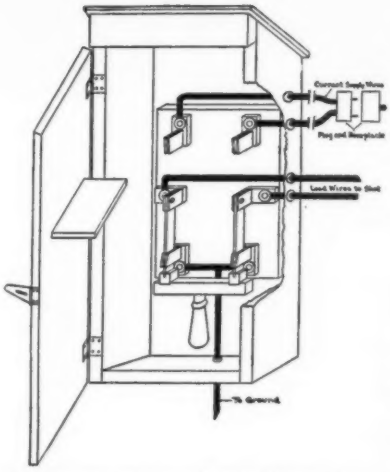
Even though blasting machines may be in good condition or power blasting circuits furnishing ample current, the current very often is not evenly distributed throughout the connected caps, this being usually true of series circuits because of inevitable current leakage. There is no such thing as a perfectly insulated blast.

When the current is applied to a leaky blast circuit, some of it immediately leaves the foremost caps, to flow through the earth, rock, etc., succeeding caps and wires leaking still more, until the center of the series circuit is reached and a minimum current is flowing in the caps.

From there on the condition is somewhat reversed; the current begins to leave the conducting element of wet earth, lime, or metal-seamed stone and again enters the caps and network of wires. The reason is that the current must of necessity re-enter the caps or wire circuit to flow back into the machine.

A simple test for the blaster to make, when using a blasting machine, is to hold one wing nut or connecting lug on the top of the machine, while some other person operates the machine with full force. The resulting electrical shock will prove that current has electrically charged the earth

● Above: A handy way to transport blasting cable. The cable reel is simply mounted on the same axle as a pair of old wagon wheels. Below: Dry and uniform sand for tamping is assured by screening.



● Diagram of a good switch box. Note that it cannot be locked unless the switch is in the down, or short-circuited position.

nearby and is flowing back into the machine through his damp shoes and body.

Formerly some manufacturers recommended 100-cap machines for larger blasts, fortunately the trend now is to limit the series to 50 caps, since the longer the series, the greater the resistance and consequently the more aggravated the leakage condition. A recent development is the twin-fifty machine, shooting two rows of 50 caps each, requiring an additional binding post over the standard blasting machine.

Power Blasting

Where blasting operations are on a sufficiently large and permanent scale to merit the installation of facilities for lighting, power, etc., steps should be taken to ignite blasts with power.

With power available the number of caps per series can be reduced, thus reducing the resistance and ground leakage, the various short series being connected to parallel lead wires, an impossibility with a blasting machine.

Where conditions require that steel or rope matting be used to prevent flying debris, this circuit is most convenient since each series is constantly checked with the galvanometer for continuity of circuit and leakage while the matting is being placed and thus troubles are readily detected and corrected.

For tunnel, shaft, and open cut work where deep holes and tough rock require heavy and closely compacted charges, the parallel circuit is unsually employed.

Practically all the troubles due to current leakage are eliminated here since each cap draws its portion of current from the line at the same instant as the others.

Grounded Electric Current

Since most state laws and local ordinances require the grounding of low voltage circuits, some precautions must be taken to eliminate the grounded phase in blasting circuits.

Wisconsin orders on explosives prohibit the use of grounded current for blasting, and to good purpose, since all the current should pass through the caps and none of it be shunted around the caps through the conducting earth back to the grounded phase.

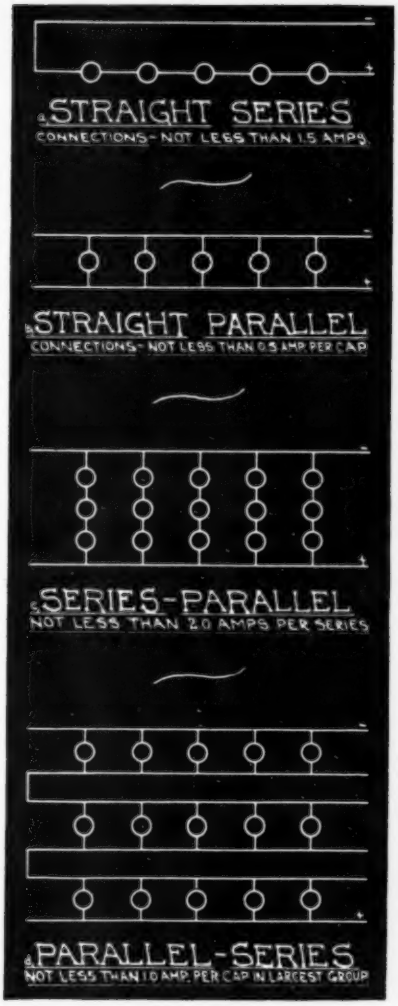
Practically all power available being alternating current, this elimination of the grounded phase is easily accomplished by inserting a small transformer in the supply line.

The transformer having the same number of wire turns in the primary as in the secondary, there is no stepping up or down of the impressed voltage. The transformer merely eliminates the grounded phase by reason of the inductive coupling of the iron laminations. No appreciable current is consumed during idle periods.

The switch box must be so constructed that the lid can only be closed and locked in the down and short-circuited position, thus insuring the blaster against coupling a live lead wire to a blast. It also eliminates the ever-present hazard of "sneak" currents flowing in the lead wire since, the switch being down, the cable is both short-circuited and thoroughly grounded.

Only the best lead wire should be used with any type of electric current, the best insulation being live rubber.

Conductors must be stranded for flexibility, two wires under one cover being acceptable, but single conductor leads should be furnished for the end near the

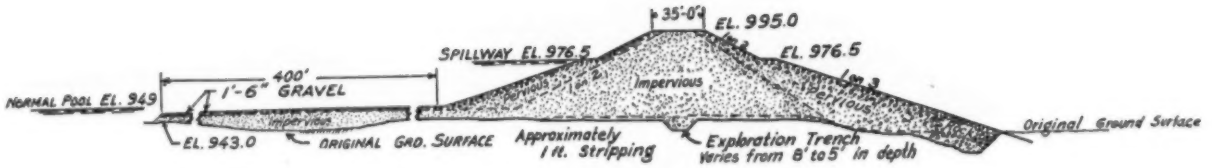

STRAIGHT SERIES
CONNECTIONS - NOT LESS THAN 1.5 AMPS.
STRAIGHT PARALLEL
CONNECTIONS - NOT LESS THAN 0.5 AMP. PER CAP.
SERIES-PARALLEL
NOT LESS THAN 2.0 AMPS. PER SERIES
PARALLEL-SERIES
NOT LESS THAN 1.0 AMP. PER CAP IN LARGEST GROUP

● Drawing showing various types of sound blasting series, with minimum current for each.

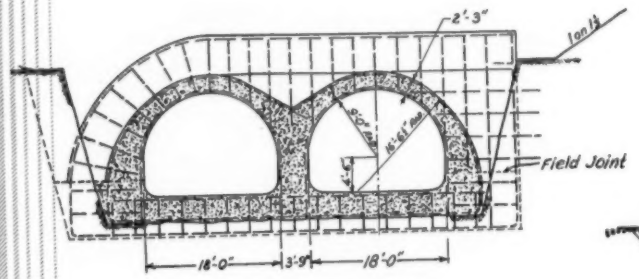
blast, since they receive the severest abuse.

The foregoing information should make it clear that successful blasting will only be obtained when every reasonable effort is made to insure good workmanship, and when the best of materials are used. Efficiency and safety are so closely allied they are well nigh inseparable, we cannot have one without the other.

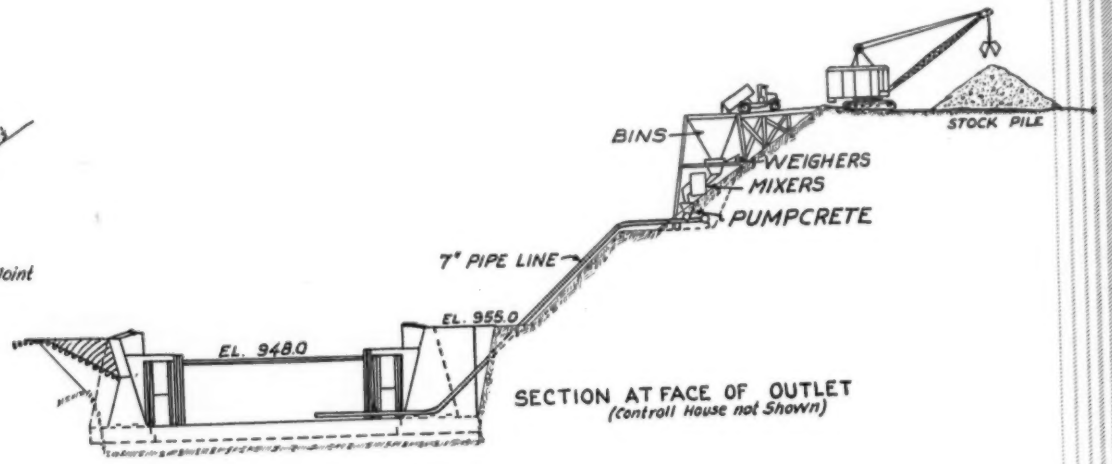
Economy in blasting is not obtained through hurried slip-shod methods or through the use of inferior grades of explosives and equipment. One serious accident, and blasting accidents usually are serious, will wipe out any theoretical or apparent savings made.



TYPICAL SECTION OF DAM



CONDUIT SECTION



SECTION AT FACE OF OUTLET
(Controll House not Shown)

SECTIONS - BEACH CITY DAM

MUSKINGUM WATERSHED

BEACH CITY DAM

William Eisenberg & Sons use Pumpcrete method of concrete placing in constructing outlet works and spillway for one of the 14 dams on the Muskingum Valley project.

By **E. D. ROBERTS and HANK FIGHT**

WITH 14 dams and reservoirs under construction, elimination of flood menace in Ohio's Muskingum Valley is well under way. The Muskingum Watershed Conservency District, a political subdivision including 18 Ohio counties, was created in 1933. It will handle operation and maintenance of the big coordinated flood control and water conservation project, which is being constructed by private contractors under supervision of the U. S. Army Engineers.

Total cost of the project is about $40,000,000. The federal government's contribution — for construction, including relocation of utilities and railroads is $25,590,000. The Ohio legislature has appropriated $2,000,000 for rights of way, and the state highway department is supervising road relocation costing about $6,000,000. Private property owners who will receive flood control and other benefits are contributing $6,667,000 to the project.

Permanent lakes, ranging in size from 350 to 3550 acres, will be created by 11 of the 14 reservoirs. All but one of the dams backing up these reservoirs are earth fill structures; the single exception, Dover Dam, being concrete.

The project involves construction, besides dams, of 11 levees; relocation of 150 miles of highways, 65 miles of railroads, 207 miles of telephone and telegraph lines, 65 miles of gas lines, 65 miles of power lines, and 13 miles of oil lines. Three entire villages, and parts of 11 others, must be relocated.

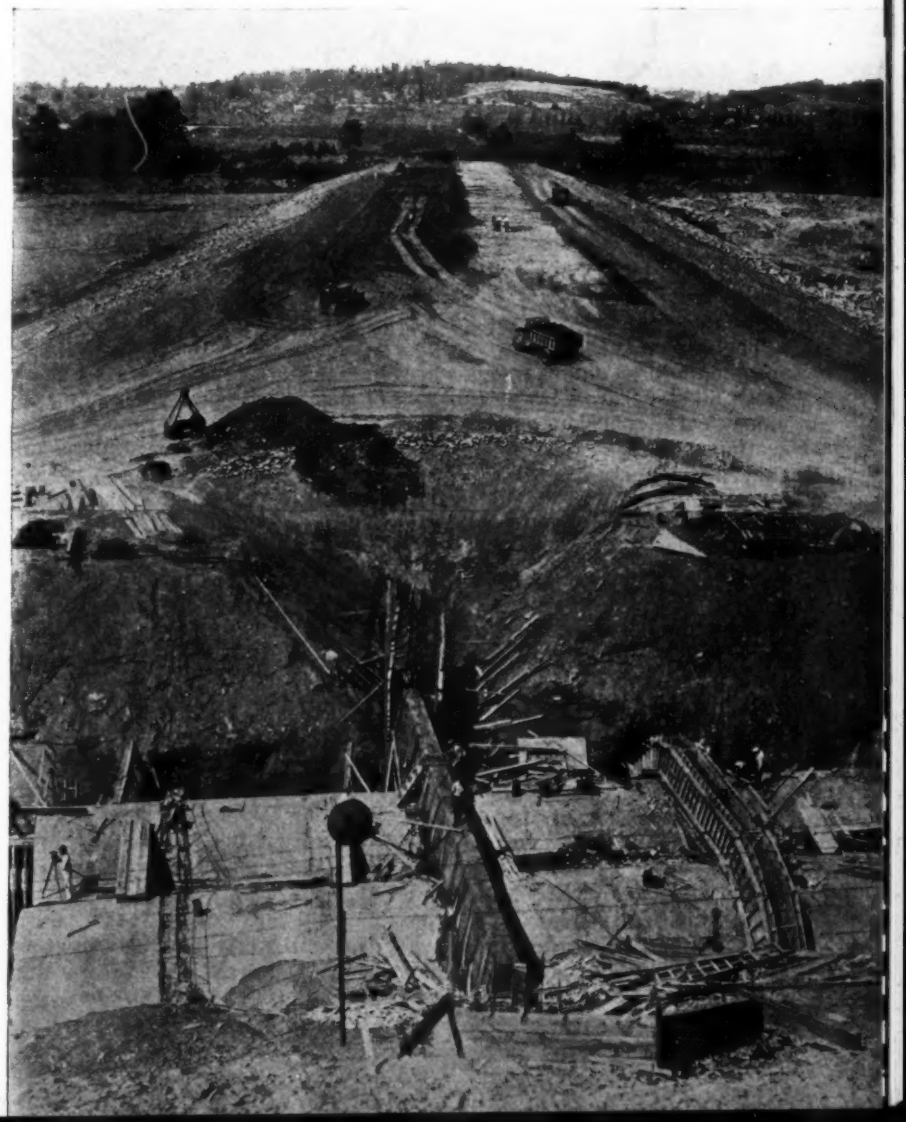
The project's national aspect, and the consequent allocation of federal funds, comes from the fact that 10 per cent of the Ohio River's flood waters at Cincinnati have their source in the Muskingum and its tributaries.

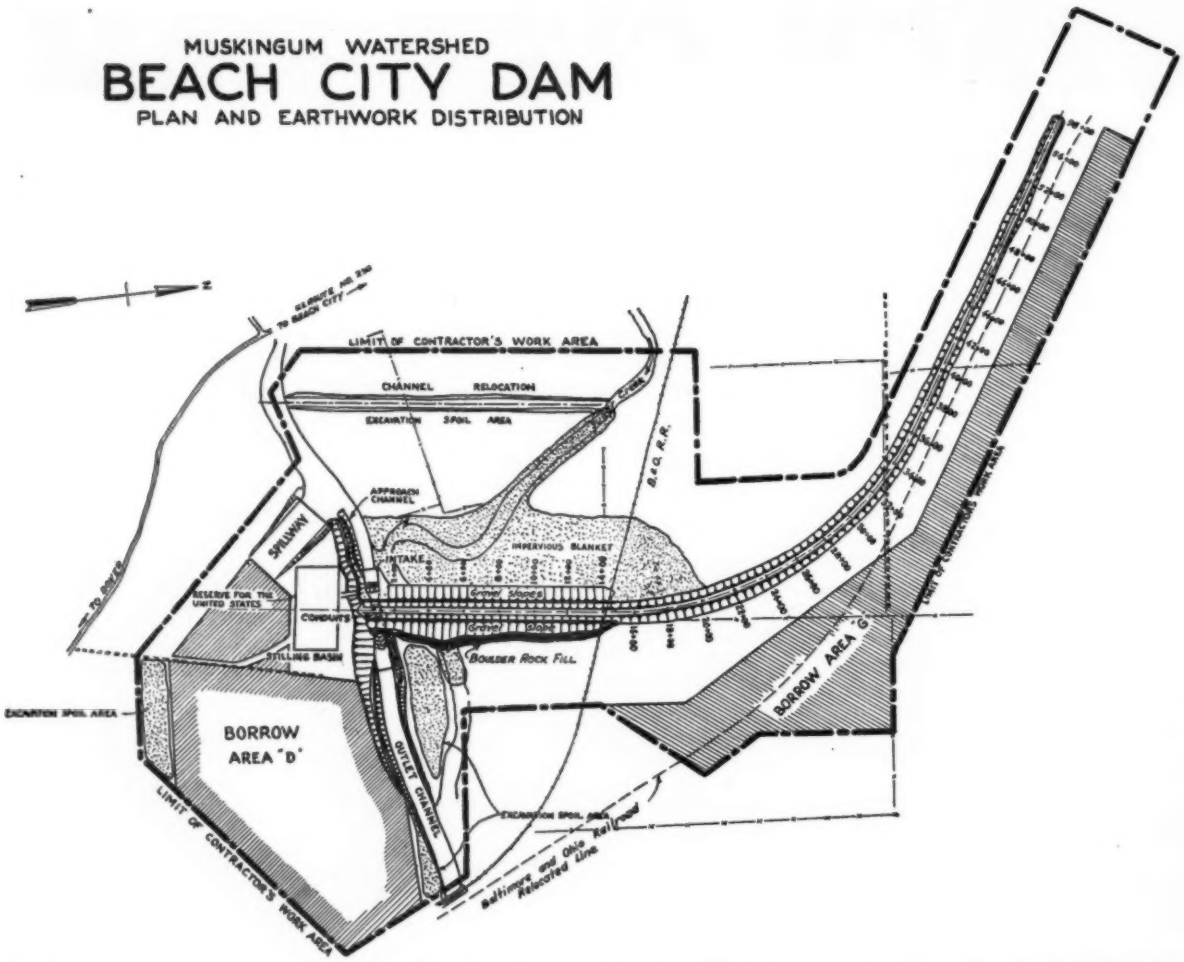
Beach City Data

Beach City Dam, fourth largest of the 14 in total cost, is located on Sugar Creek, one and one-half miles south-east of the village of Beach City—which is about 20 miles due south of Akron. Total cost for this section of the project is about $3,362,017. The contract for dam and outlet works was awarded to William Eisenberg & Sons of Camden, N. J., on its bid of $843,514.

The work on this project was carried out under the direction of A. Eisenberg, acting as general superintendent; H. Eisenberg, who organized the construction of the concrete diversion works; and R. B. Jaggard, who acted as

● **A general view of Beach City damsite. In the foreground are the conduits leading to the stilling basin, with cut-off wall construction shown in center. Fill for main dam is shown in background.**





chief engineer for the contractors.

The dam itself, as shown in an accompanying diagram, is an earth fill structure with an impervious core, pervious "blanket" sections, and a rock toe. The curved fill section is 5600 feet long and built up to elevation 995.0—which makes it approximately 60 feet above ground level. General layout of dam, spillway, stilling basin, conduit and outlet channel can be seen in another of the accompanying diagrams. The dam will create a 420-acre lake for conservation purposes, and allows a 6,150-acre spread of water before spillway elevation is reached.

Equipment moved in to start digging included 16 heavy-duty Mack trucks, seven caterpillar Diesel tractors with bulldozers and sheepsfoot rollers; and seven shovels, two Koehring and five Bucyrus-Erie. The total dirt moving job comes to about 1,724,200 yards.

A great depth of strata of pervious and impervious materials of sedimentary origin made construction of a core wall out of the question. Danger of seepage under the dam was minimized by excavating a cut-off trench along the axis of the dam to intercept any farm tile or man placed under drainage.

Preparing the Site

The site of the main dam was further prepared by stripping off the loam. The main dam embankment was constructed in six inch layers with the impervious core protected on both the upstream and downstream sides by pervious gravel fills. These layers of both pervious and impervious material were consolidated by means of sheepsfoot rollers drawn by Caterpillar tractors. The downstream toe of the dam is composed of a rock fill which acts as an inverted filter carrying seepage to the old stream channel and thus to the permanently relocated stream. The upstream face of the dam is protected against wave action for part of its height by dumped riprap.

Before excavating was begun, thorough soil tests indicated exactly where to secure material for the desired fill combination. Borrow pits are close to the scene of operation, as indicated on one of the accompanying drawings. Rock for rip-rap was taken from the excavation for outlet works and spillway. Shale found at the same site was mixed with clay in forming part of the impervious dam fill.

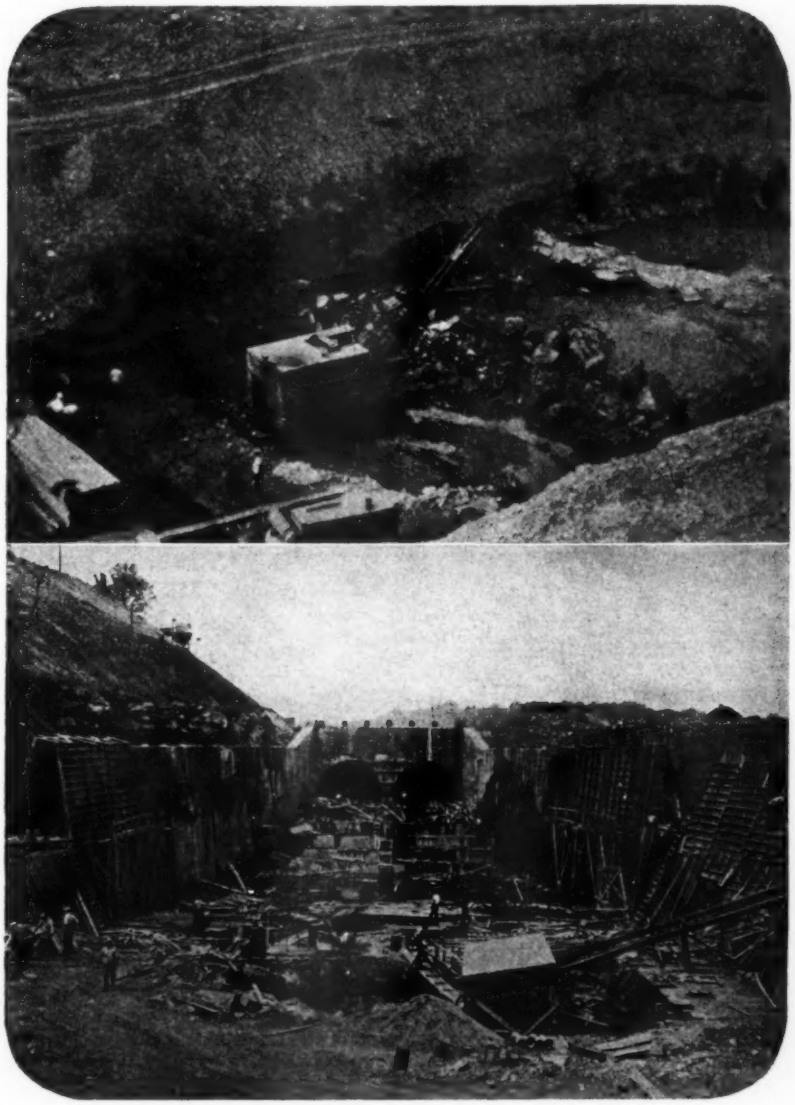
The first dirt was moved on this dam on March 28, 1935. Shortly after a good start had been made, the Muskingum Valley experienced its worst flood since 1913, with three cloud-

bursts breaking loose within a radius of 60 miles—and on the same night. Six to eight inches of rainfall were recorded in six hours.

Despite the handicap of the flood and the extreme wet weather experienced during the 1935 working season, two Bucyrus-Erie 37-B shovels, one 43-B Bucyrus-Erie shovel, and one gas-air Bucyrus-Erie were maintained in service both loading material from borrow pits and excavating the cut for the outlet works. Flood lighting system, enabling the carrying on of the work after dark, was installed to counter-balance loss of time due to bad weather.

Interest in the construction of concrete structures centers largely on the outlet works, as no unusual problems or design were involved in the spillway. Water enters the intake section by flowing over a control weir at a level one foot below normal pool elevation, which is 949 feet above m.s.l. At the downstream end of the intake pool are six mechanically-operated steel gates, with the control house being located directly above them. Erection of gates and control mechanism was handles with a Bucyrus-Erie gas +air crane, which also placed and removed concrete forms, and moved aggregates from reserve stock piles to bins.

● **Top: One of the Eisenberg Bucyrus-Erie 37-Bs handling excavation for the stilling basin. Bottom: A later view of the stilling basin, showing conduit outlets, and concrete sidewalls in process of erection.**



The gates are seven by fifteen feet, and pass the water into the first section of conduit, 15 feet long, cast-iron lined. The conduit begins as six tunnels, with dividing partitions becoming narrower until they end at a point 28 feet beyond the gates, and the conduit continues as a single passage 40-feet wide and 15-feet high. This single channel then narrows down to 36-foot width, maintained until a center partition again begins, and the conduit becomes two tubes which pour the water into the open stilling basin which has a maximum width of 100 ft. The basin floor is stepped down until it is 13 feet below the tubes, with two rows of baffles on the pool floor.

Pumping Concrete

The Pumpcrete Method of placing concrete was adopted, which permitted Harry Eisenberg to erect his mixing plant at the center of the area requiring concrete, and on the slope of the outlet works bank so as to have a full gravity, proportioning and mixing plant. Cement and aggregates were trucked from the nearest railroad siding and dumped directly into the cement and aggregate bins. An extra supply of aggregates was stocked on the hill for direct handling into the bins by the Bucyrus-Erie gas+air crane. Like the excavating part of the job, concrete placing has proceeded with a smoothness which is a real tribute to the ability of the contractor's organization.

Weighing batchers were used to measure the constituents of the mix which discharged directly into either of two 28S concrete mixers which in turn discharged into the remixing hopper of the double Pumpcrete, a pump for pumping concrete in much the same manner that a piston pump pumps water. The double Pumpcrete consists of two Pumpcretes operating in timed relationship on one frame with a single power unit and discharging into a "Siamese" which combines the discharges of the two pumps in a single line for transmitting to the

(Continued on page 312)

EXCAVATING

FOUNDED 1905

A Monthly Publication

Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

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Government Spending

With all the publicity which has been given the tremendous expenditures our government has made—and still is making—it is difficult, if not impossible, to get an accurate, clear picture of just how much is spent, and what it is spent for. If we knew that, we should be in a much better position to say how much spending is justified, and when the furious outpouring of the citizens' money should cease.

Clarence W. Tacklen of New York University has the following to say on the subject:

"In one way it is too bad that daily prices are not quoted for the different services rendered by the Federal Government. If such could be prepared, and tabulated as clearly as the security prices in our newspapers, people would soon begin to take notice of what is happening to their money, which rolls so easily in and out of the Treasury.

"However crazy the idea may be, I have a feeling if something like this were done, far less would be heard from those citizens who frequently exclaim, 'Oh, pshaw! Ain't the government putting more money into circulation? What you worryin' about?' But as it is now, only a few of the country's leading journals print anything about the Treasury's receipts and expenditures. Even then, only once a month are their readers reminded of how budget-balancing is progressing on the good intentions and hopes plan.

"Occasionally, a statement appears that the Treasury Department doesn't need any 'new money' in view of probable high income tax receipts. Or, it is announced that Federal relief must be made permanent. But these notices indicate little or nothing of the way in which the public spenders are failing to mend their ways.

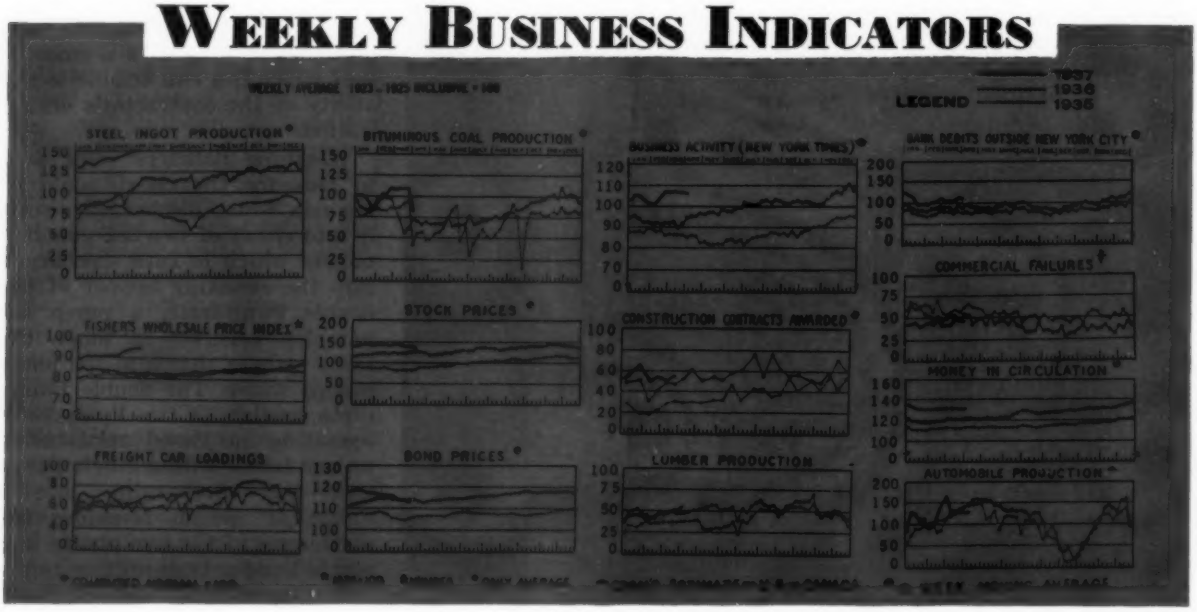
"An analysis of the published figures is more clarifying. According to the Treasury's January statement of receipts and expenditures, there are still many applicants for government funds. One would suppose that they had become as few and far between as old NRA employees or as beneficiaries of Revolutionary War pensions. The nation is now at least four years removed from its financial emergency, and in the midst of a recovery, faced again with boom hysteria. But, the expenditures for agricultural aid, general relief, public works, assistance for home-owners, and reconstruction loans are still reported in lusty figures under the title of 'Recovery and Relief.'

"Yet, for the Federal planners, buget-balancing is 'just around the corner.' If only the taxpayers can have a little more patience and maintain their usual good deportment, there is the long chance that the government will not spend more than it collects as revenues during its next fiscal year ending in 1938.

"Meanwhile, another drought, dust storm, grasshopper plague, or even an inviting war may put in an appearance, making larger expenditures unavoidable, and offering a good out for the balancing planners. In the absence of any such developments, however, the betting odds that another deficit will occur may still reach 100 to 1.

"The last half of the present fiscal year has already begun with a shortage of $347,500,000 —a deficit $119,400,000 larger than for January, 1936. On the average, the Treasury spent on every one of its 25 working days $13,900,000 more than it took in. At this pace the Federal deficit is increasing at an annual rate of $1,430,000,000.

Weekly Business Indicators



"And, increasing at the rate of two billion dollars annually, Treasury expenditures during January amounted to $635,000,000 and were approximately $162,300,000 higher than for the same month a year ago. Every day that the Treasury opened its doors in January, it spent on the average $25,400,000. Even if the returns of loaned capital to the government are treated as receipts (as they really should be) instead of as deductions from expenditures (as they are), the excess of expenditures for January is still over $85,600,000.

"If anyone wishes to become a champion optimist, he ought to practice stretching his chords of good cheer on these figures. But for many people there is a limit to the rejoicing. To enter now upon a six-year program of coordinated public works, to put relief on a permanent basis, to revive the NRA and AAA, to provide farms for all embarrassed farm tenants, besides continuing the outlays for social security and enlarging the public utility program, is to load the taxpayer's cart just a little too heavily.

"Where are the public finance experts who can find ways to reduce public costs now that practically all of the sources of taxation and public borrowing have been discovered? Of course, if it's dictatorship that the country wants, there isn't any use raising the question, or even trying to get an idea of government costs."

● Night doesn't put a halt to operations at T. V. A.'s Chickamauga Dam. Here is visual proof of the night brilliance in a general view of the work.

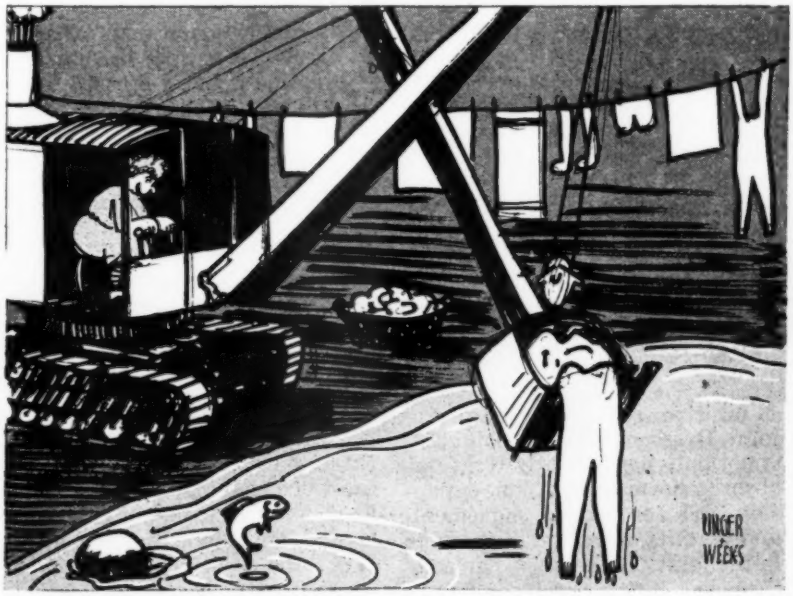
March Construction

March construction in the 37 Eastern States totaled $231,245,900 according to F. W. Dodge Corporation. In February the figure was $188,257,300 while for March 1936 the total was only $198,761,900. Of the March 1937 figure $90,167,600 represented residential building; $88,601,500 went for non-residential building and $52,476,800 went into heavy civil engineering projects.

The March residential total was about 65 per cent ahead of the total of $55,220,600 reported in this class for March 1936.

Residential building gains over March of last year were shown in each of the major geographic districts without exception. The most important increases occurred in the Chicago territory (Northern Illinois, Indiana, S. E. Wisconsin, Iowa); in Southern Michigan; in New England; in the Southeast; and in the Pittsburgh territory (Ohio, Western Pennsylvania, Kentucky, W. Va.)

Non-residential building gains over a year ago, were they occurred, were largely in private as distinguished from public jobs. Losses in total non-residential building from March 1936 were concentrated in the Southeast, Southern, Michigan, the St. Louis territory and Texas.



"Nice of Joe to lend me this on his day off."

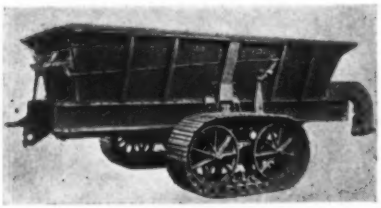
1936 Indexes

Indexes for EXCAVATING, Volume XXX, 1936, are now available. You can secure your copy by writing to the Excavating Engineer Publishing Company, South Milwaukee, Wisconsin.

EQUIPMENT
You Ought to Know About

Athey Forged-Track Bottom-Dump Trailer

A new 18-yard Bottom-Dump Trailer, mounted on actual capacity 30-ton wheels, is announced by the Athey Truss Wheel Co., 5631 West 65th Street, Chicago, Illinois.



The new trailer is built to carry capacity loads wherever track-type tractors can operate. The axle and drawbar are spring-mounted to absorb loading and roading shocks. There is a simple, positive, mechanical windup. The construction of the entire unit is exceptionally rigid for heavy loads.

"Caterpillar" Trackson Pipe Layers

"Caterpillar" RD6 and R5 Tractors are now available equipped with Trackson Pipe Layers, according to announcement made by Caterpillar Tractor Co., Peoria, Illinois. Three additional models of "Caterpillar" track-type Tractors will also be available with Trackson Pipe Layers in the near future.

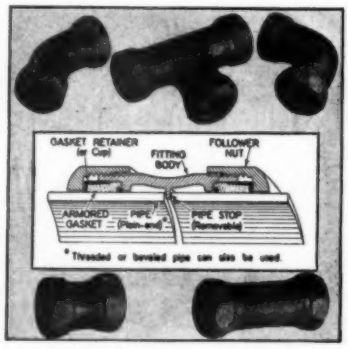
It is claimed the entire structure can be removed easily and quickly when the tractor is to be used extensively for other work. In operation the load and boom lines are raised and lowered under power by means of worm-driven winches. A selection of three speeds in either direction for both boom and load line drums is provided by the special Trackson transmission and cross drive mechanism. A single lever controls the direction of rotation of the drums, so that either can be raised or lowered separately or together, as desired.

Power for driving the pipe layer is from the "Caterpillar" rear power take-off through a ball-bearing-mounted friction clutch.

Dresser Compression Fittings

"Time Out" for cutting pipe to exact lengths, threading, grooving, flaring, or screwing up joints in cramped quarters, is no longer necessary, according to the latest announcement from the S. R. Dresser Manufacturing Company, 427 Fisher Avenue, Bradford, Pennsylvania. With the standard line of Dresser Style 65 Fittings just announced, nothing but an ordinary wrench is needed to complete a joint in a few moments.

After inserting the plain-end pipe into the fitting (which comes completely assembled), it is only necessary to tighten two threaded octagonal follower nuts with a few quick turns of the wrench. As this is done, gaskets at each end of the fitting are compressed tightly around the pipe, forming



a positive seal. The resulting joint, Dresser engineers point out, is not only permanently tight but absorbs normal vibration, expansion and contraction movement, and permits deflection of the pipe in the joint. If the pipe is already threaded, it can also be joined in the same way.

Mack Announces Two New Models

Two new models, the EM rated at 20,000 pounds gross, and the EQ, 23,000 pounds gross, have just gone into production, according to announcement from Mack Trucks, Inc.

The new trucks are deluxe, streamline cabs with sloping windshields, the angle of which is repeated in the radiator grille and louvres. Cab roof is of all-metal construction built integral with the cab. Safety glass all around is standard.

The model EM is powered by a six-cylinder engine developing 79 h.p. at governed speed of 2,300 r.p.m. and the model EQ has a powerplant generating 92 h.p. at governed speed of 2,300 r.p.m.

Four wheel brakes on the new models are direct mechanical of the internal expanding type and are vacuum booster actuated. Total foot brake area on each model is 468 square inches.

The chassis frame on both models is of pressed carbon steel. It is braced by three pressed steel, deep flanged box girder cross members, with alligator jaw attachment to the side members, and two channel cross members.

Rubber Lined Sluice Pipes

The Goodyear Tire and Rubber Company, Akron, Ohio, has recently completed the manufacture of a special type of sluice pipe for use on a large PWA dam construction job near Springfield, Mass. The pipe to be used on this job was shipped directly to the Goodyear plant where it was lined with a thick, tough rubber layer, compounded especially to resist the wearing action of the sand and water and protect the steel pipe.

Roebling...
The pacemaker in
wire rope development
THE most exacting basis for judging wire rope performance is AVERAGE SERVICE.
This is the basis advocated by Roebling, in which rope cost per ton of material handled, or per other unit of service measurement, is based not on the service of a single rope but on the *average* service of several ropes.
John A. Roebling's Sons Co.,
Trenton New Jersey
JAR

Field Notes

Specification Change Vitiated Bid

After bids had been received on a sewer job, city authorities accepted a construction company's proposal, but eliminated 20,000 feet of sewer lines—amounting to about 15 per cent of the work contemplated when the bids were received. The company declined to enter into a contract because the project was cut down without its consent. The city sued the company and its surety for the increased cost of the work resulting from a reletting to the next lowest bidder. A federal judge in North Carolina decided that the city was entitled to collect damages, but his decision was set aside by a higher court — the United States Circuit Court of Appeals, Fourth Circuit—in the case of Northeastern Construction Co. v. City of Winston-Salem, 83 Fed. 2d, 57.

The Circuit Court of Appeals applied the fundamental rule of law, that an offer must be accepted according to the terms of the offer, before the acceptance converts it into a binding contract. The court said that it made no difference that the change might not have injuriously affected the bidding company, adding: "It cannot be gainsaid that it was a material change and no proposal or acceptance can be materially changed, by either party, without the assent of all the parties."

The trial judge was influenced in his contrary decision by the fact that the specifications reserved to the city's commissioner of public works right to change the contract quantity of work before its commencement or during construction progress. The higher court ruled that this clause "certainly does not give the engineer any power over the transaction until a binding contract is executed and entered into."

Arthur L. H. Street, Attorney at Law.

Ready Source of Soft Tubing for Metal Spectacle Bows

Metal eye glass, or spectacle bows, when worn continuously in warm cabs, or where it is hot, very often irritate the skin where they hook over the ears and run along the temple. A soft rubber coating or jacket for the wire strips is often a difficult thing to procure quickly. The soft pliable

rubber tubing which is the cord part of a common inexpensive child's jumping rope makes a very satisfactory covering as shown here. The hole through the small tubing is just large enough to go easily but snugly over the wire bows. Easily applied and removed when no longer needed. Some four or five feet of this small tubing is between the wooden handles of one of these toys, enough to last for a long time with frequent renewals of the protective covering.

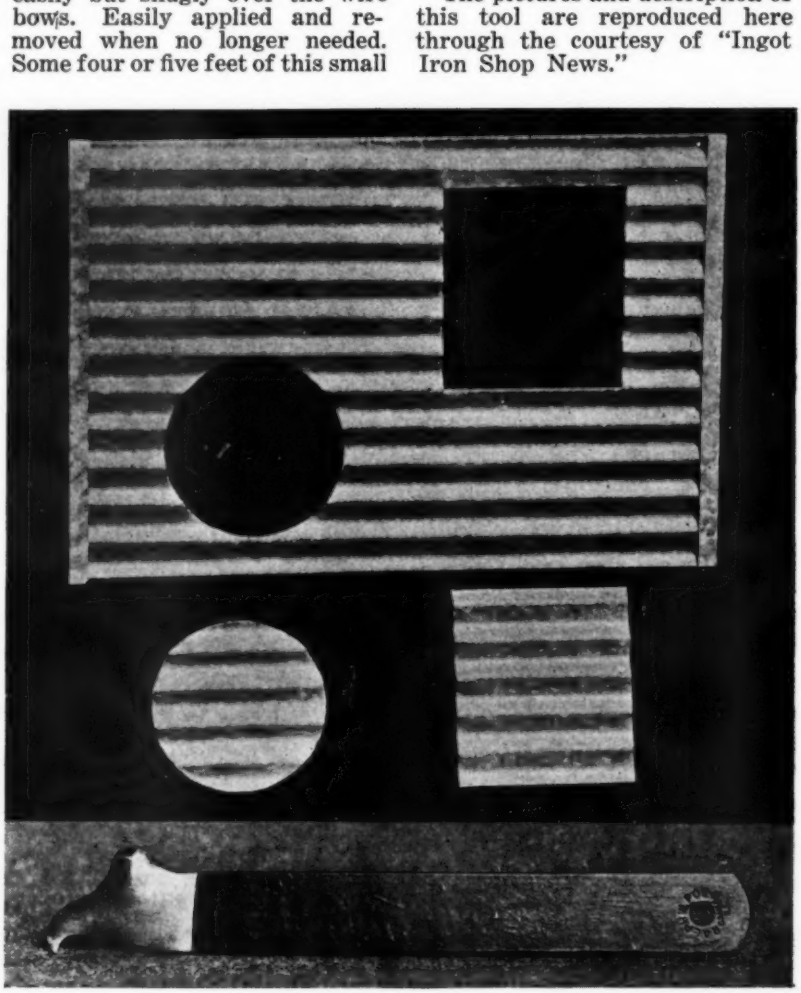
—Frank Bentley.

Simple Tool for Intricate Cutting Jobs

Designed by Ralph W. Poe of Canton, Illinois, the cutting tool shown below—with a sample of its work—is primarily for use with a hammer. The point is so designed that it will not stretch or distort the metal.

The tool is not limited to flat sheets, but can be used with corrugated iron, corrugated conductor pipe, gutters, furnace castings, and auto bodies and fenders. It can be used on metals up to 16 gauge in thickness.

The pictures and description of this tool are reproduced here through the courtesy of "Ingot Iron Shop News."



epeat

2

3

4

ne of the most spectacular efforts of an to control the destructive forces of ature is San Gabriel Dam No. 1, near os Angeles. This mammoth structure ecessitates the blasting, quarrying, re-oving and placing of 10,809,000 cu. ds. of rock and earthfill . . . will tower 75 ft. above bedrock, with a crest length f 1,540 ft., and a base width of 1,950 ft. heduled for completion in June, 1938, will be the largest, highest dam of its pe in the world.

Vorking against time and the elements, ith reliable performance of equipment d big output absolutely essential . . . Vest Slope Construction Co. selected a eet of Allis-Chalmers Tractors and peed Patrols. Photo No. **1** shows a neral view of the fill, with a Model L-O" Oil Tractor and sheep's foot roller the foreground. In No. **2** and No. **3**, her "L-O's" are shown bulldozing ma-rial down the west slope of the canyon r loading by shovel into trucks. o. **4** shows an A-C Speed Patrol grad-g and leveling the fill where trucks ve been dumped.

n jobs large and small, Allis-Chalmers ractors not only make more trips per our but give the kind of dependable erformance that leads to "CHEAPER ER YARD" dirt moving. That is hy Allis-Chalmers owners "repeat".

Controlled Ignition OIL TRACTORS

SHOTS *from the Firing Line*

Florida Canal Hearings

Three reviews of the Atlantic-Gulf Ship Canal in Florida have been made since work on the project was halted when the original contracts were wound up last summer. The first review, made by a special committee of five engineers, recommended completion of the canal, estimated the cost at $157,585,000. The Rivers and Harbors Board of Engineers, conducting the second review, set necessary cost at $263,838,000, decided the project was not economically worth while. Major-General E. M. Markham reported that the canal was justified, that the cost would be $197,921,000.

General Markham's report was amplified when he appeared as the first witness before the House Committee on Rivers and Harbors, followed by consulting engineer Malcolm Pirnie, and Lt.-Col. Brehon Sumerville who was in charge of the work already completed on the canal.

The differences in estimated cost of canal completion are largely due to differences in size of canal, unit costs (principally dredging), interest charges, and maintenance cost. Completion will involve considerable dredging in soft rock, the cost of which is difficult to estimate because of lack of previous experience with this type of work.

All three reports agreed substantially on the canal route, a sea-level type, the annual amount of commerce and a value based on the 1935 Atlantic-Gulf traffic.

Spring Spurs Activity at Fort Peck

The 1937 dredging season at Fort Peck is off to the best spring start yet. First of the four electrically-operated 28-inch dredges to swing into action was the "Gallatin," when, at 5:50 p.m., Sunday, April 4th, she commenced pumping fill material into the east side of the great dam across the Missouri River. Next unit to start work was the "Missouri" which began at 3:40 p.m., April 5th. "Getting the jump" on river ice this year by the simple expedient of starting from the protection of the winter harbor and cutting their way around the 1000 acre ice sheet in the upper borrow pit, the Fort Peck dredges are commencing the season's operations at the earliest date since the start of the project.

Rapid melting of ice in the Missouri River has enabled the Army Engineers to clear a channel above the Fort Peck Dam and remove this menace to full-scale dredging operations. Immediately the channel opened, Dredge Gallatin was moved down the river through the dam to the lower borrow pit where it will operate until the great fill is completed.

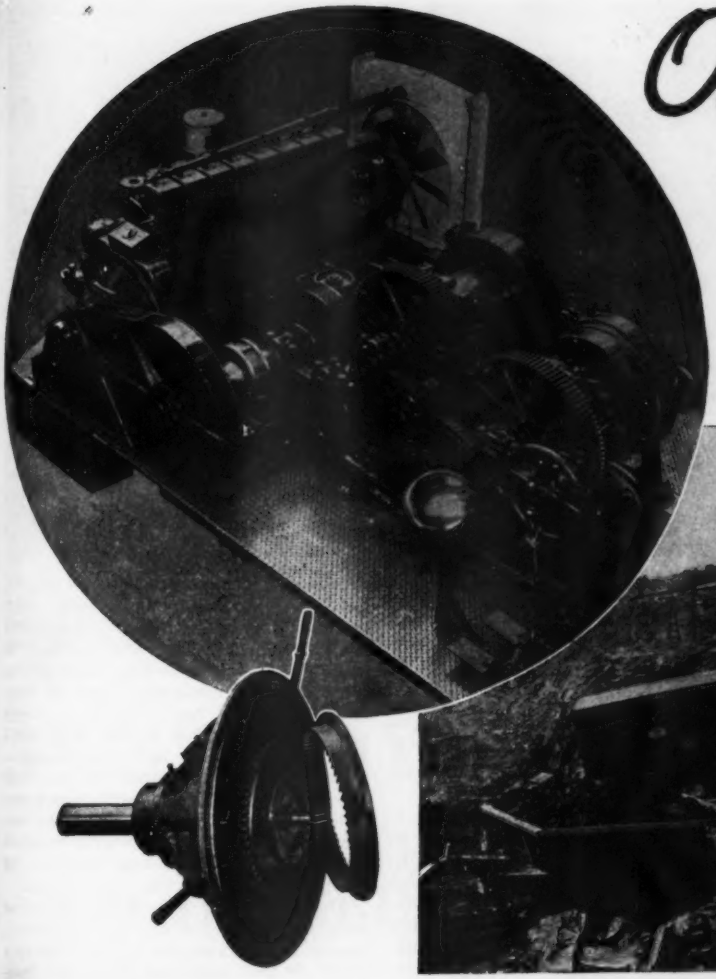
The Gallatin is now digging a channel from the river bank toward the outlet portals of the tunnels. Dredged material is being pumped into the east bank fill area against a 129-foot head with the help of one land booster pump.

The three dredges upstream are now working in temporary positions but will be moved to their scheduled locations in the near future. Dredge Jefferson will go to the upper end of the borrow pit whence she will pump into the west bank fill area, against a 156-foot head.

Dredge Madison will take a position nearer the dam, first removing a small island and then a series of cuts from the west bank. Dredged material from the Madison will discharge into the east side fill area.

Dredge Missouri will remain near the

● **A striking air view of operations on the All-American Canal. You are looking East, with the completed section leading toward Pilot Knob. In the foreground two Bucyrus-Monighan walking draglines move the canal along, and if you look closely, you can see a smaller dragline finishing grade on the right bank.**



Outstanding

SIMPLICITY OF DESIGN

plus ability to stand hard usage

● Facing one tough job after another, a power shovel has to have a heavy-duty engine . . . and a power take-off rugged enough to transmit full engine horsepower and to stand years of hard usage.

The Twin Disc X8295 Power Take-Off has that ability . . . plus the outstanding simplicity of design which makes it easily adaptable to Harnischfeger machines, say engineers of the Harnischfeger Corporation, builders of material handling machinery for over fifty years.

The clutch being a disc clutch requires no counter weight such as is needed with a shoe clutch where counter weight is required to offset the centrifugal force. Twin Disc internal gear design is also a valuable feature, as it spreads the wear of connecting parts over a large area and also acts to take care of any slight misalignments which result from severe field service.

What is *your* clutch problem? Write for specific recommendations. Engineering data on request.

TWIN DISC CLUTCHES

TWIN DISC CLUTCH COMPANY

1335 RACINE ST., RACINE, WISCONSIN

For your convenience in writing to Twin Disc Clutch Company, you will find a card bound in this issue.

entrance to the winter harbor until she can be placed near the Madison. Material from this dredge will go into the east side. The Missouri will probably be last to get into position for the regular season's work. When all machines are finally placed there will then be three lines pouring fill into the east side, which is not yet as high as the smaller area on the west side.

Up to 8:00 a.m., Monday, April 12th, approximately 643,000 cubic yards of material had been moved as a start for the year 1937.

The Massman Construction Company (Spillway Builders, Inc.), contractors for excavating and lining the flood spillway, have started preliminary operations for their year's work. Good weather for the past week having dried up the site, they are sending out bulldozers and road graders to reshape haul roads and scrape up debris. A few carpenters are at work on job office buildings while mechanics are tuning up cranes, trucks, shovels, and other machines in preparation for active work.

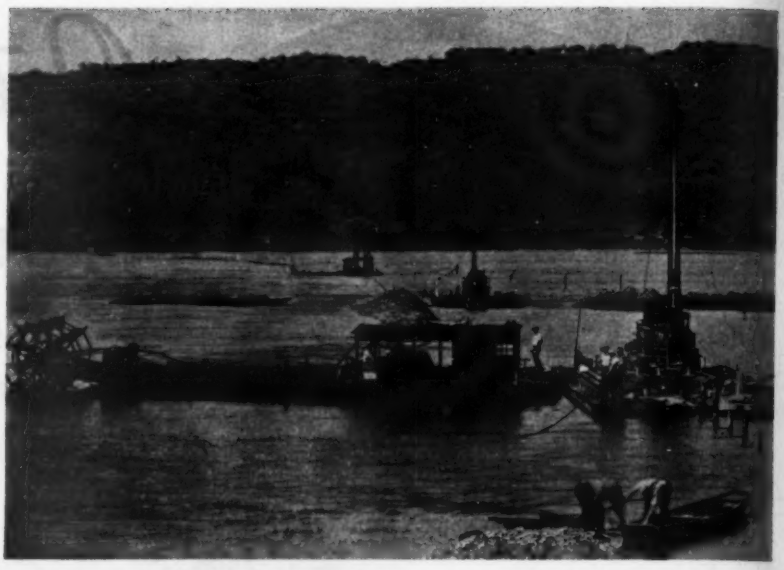
Addison Miller, Inc., and Fielding & Shepley, contractors for the spillway gates and cut-off structure, have not as yet resumed operations.

Open-cut excavation at both portals of the diversion tunnels continues unabated, while pouring of the few remaining slabs of channel floor near the downstream mixer plant is proceeding.

Removal of track and debris from No. 3 tunnel between the gate shafts and the outlet portals is under way, the cleaning of No. 2 having been completed.

The Bartlett Hayward Company, contractors installing the emergency gates, are setting the steel plate transition tubes at the base of No. 4 shaft in preparation for their final pour of concrete. The cast bronze work for the gate seats is all in place.

It is an interesting fact, in connection with the complicated mechanical and electrical installation work in the Bartlett Hayward contract, that practically all of it has been executed by local mechanics and local labor—only a few skilled men having been sent out from the Baltimore factory to install the machinery.

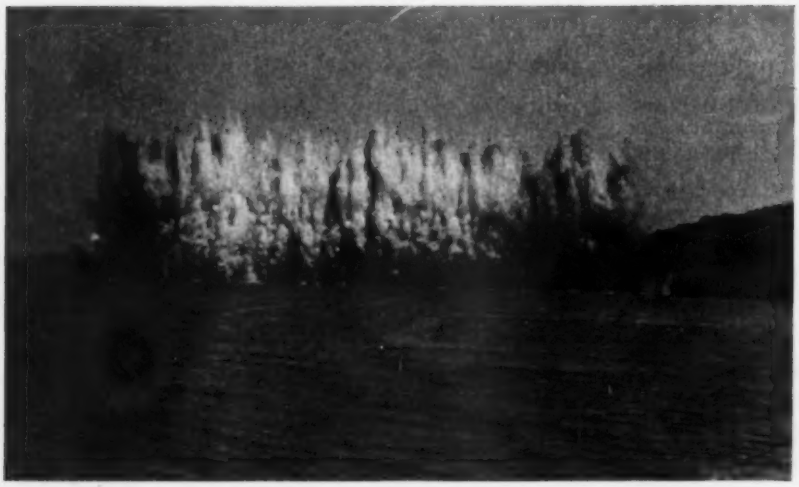


● **A Susquehanna river boat is used to push one of the drill barges into place. In the background can be seen a second drill barge and the wire-connected casings which serve to anchor the barges as desired.**

Underwater Blasting

Blasting under water is always a tough job, requiring plenty of skill and experience if the unusual problems are to be successfully met. One such job was handled by the Keystone Pipe Line Company in laying gasoline pipe under the Susquehanna River for the Atlantic Refining Company. The location of the crossing was the town of High Spire, Pennsylvania, about seven miles south of Harrisburg.

The river at this point is about four-fifths of a mile wide, and from three to twelve feet deep. The bottom is limestone, red sandstone, gravel, with some coal silt, mud and other sedimentary deposits. The problem was to lay an eight-inch gasoline main across the river at a minimum depth of four feet below the bed. Weather, rough water and an island in the way were the chief obstacles to be overcome—other than those inherent in any under-water job. The skill with which the work was handled was attested by the fact that the entire job was completed in four weeks, the actual carrying of the pipe line across the river in two.



● **A picturesque blast goes off, extending the trench across a section of the Susquehanna.**

The first step in operations, after deciding on location and line curvature, was to drive casings at 50-foot intervals about 50 feet upstream from line location. Casings were put down from a drill boat, and wire strung between them provided a continuous anchorage for drill boats, dredges and barges. The next job was to put down six-inch holes, 530 of them, spaced eight feet apart along the proposed pipe line trench, and drilled through metal casings.

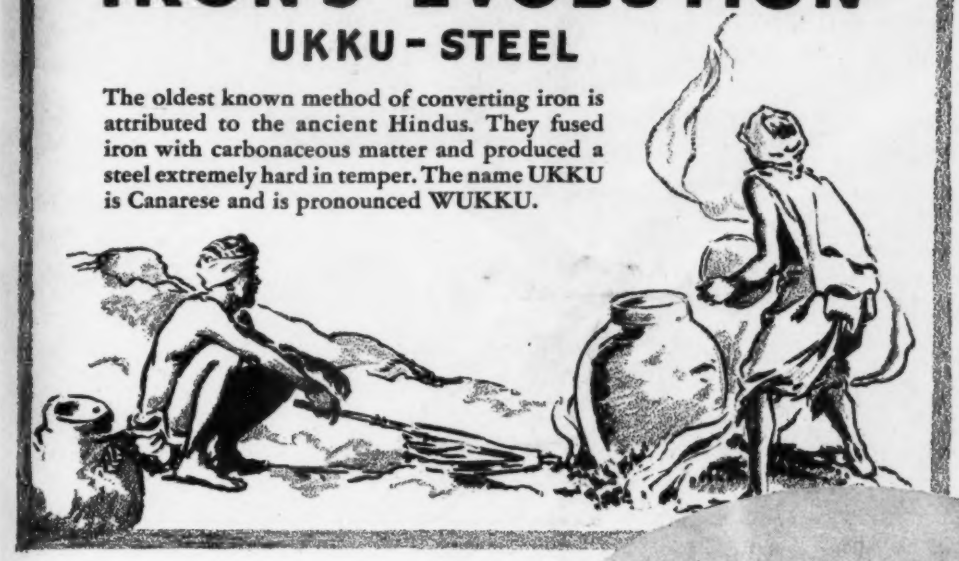
Holes were loaded from two 10 by 50-foot barges anchored flanking the line of casings with only a narrow strip of water between. The barges were moved along by poles, and carried a complete day's supply of material and equipment—dynamite, stemming material, blasting accessories, hoists, even food and water for the crew. Holes were loaded with DuPont 60 per cent special gelatin in five- by twenty-four inch cartridges. Charge per hole varied from 50 to 125 pounds, with the average being 75. Depth of water and character of material in the river bottom determined the exact charge in the individual holes.

High winds, choppy water and a strong river current made operating from the barges a ticklish job. Pulling casings once the holes were loaded was accomplished by using a steel frame straddling the gap between barges. A chain hoist supported by this

IRON'S EVOLUTION

UKKU - STEEL

The oldest known method of converting iron is attributed to the ancient Hindus. They fused iron with carbonaceous matter and produced a steel extremely hard in temper. The name UKKU is Canarese and is pronounced WUKKU.



AND TODAY.. *The* WITHERBEE SHERMAN CORP. *Produces a Rich Iron Ore . . .*

—In great demand by modern industry and used in the making of many fine alloy steels. The underground workings of the Witherbee Sherman Corporation are located in northern New York State. For years they have yielded an extremely valuable iron ore known as Magnetite —an extremely hard ore, lying in rich veins entirely surrounded by rock. Naturally, this hard ore increases drilling and blasting problems—requires extreme efficiency throughout production cycles—close attention to details.

Ensign-Bickford Safety Fuse is used. It is a detail that can be depended upon to cooperate perfectly. A century of unrelenting care—a policy of never-ending research—contribute to its perfection.

Ensign-Bickford Safety Fuse offers the assurance of dependable blasting. It is always available in a number of standardized brands, each designed for a particular set of conditions . . . Write for a free copy of the Safety Fuse Book.

ENSIGN-BICKFORD

THE ENSIGN-BICKFORD CO.

1964

SAFETY FUSE

SIMSBURY, CONNECTICUT

For your convenience in writing to The Ensign-Bickford Co., you will find a card bound in this issue.

● **Recent air view of Grand Coulee, showing diversion completed and trestles for concrete trains creeping out into the east bank area.**

frame pulled up casings through a line ending in a hook which was attached to iron pins inserted in holes near top of the casings.

Cordeau fuse was selected as the detonating agent, the primer ends being dipped in a cap-sealing compound to keep out the water. Two- by four-inch oak uprights inserted in every seventh casing, supported a connecting No. 8 iron wire to which was attached the Cordeau trunk line.

Not all the holes were fired in one shot. One shot fired 101 holes, covering a stretch 800 feet long, requiring 10,050 pounds of dynamite. A later shot, requiring 14,000 pounds of dynamite extended the trench to the York County shore.

Following blasting, the trench was cleaned up by clamshell-barge dredges. Getting pipe line—which had previously been welded into units 550 feet long—into the trench was a problem complicated by the presence of an island in the way. The pipe was sprung so it formed a temporary curved line to get around the obstacle.

This unusual job was carried on under the supervision of J. M. Williams, Keystone vice president. Working with him were R. B. O'Neal, superintendent; W. E. Stainback, assistant superintendent; Lloyd Baxter, foreman; and Paul Langford, engineer. Assisting the Keystone organization were du Pont representatives S. K. Evans, G. D. Chichester, and E. T. Wolf, who supervised blasting operations.

Editor's Note: This description is based on an article, written by E. T. Wolf, which recently appeared in the du Pont Magazine.

Washington Adopts Highway Code

Effective April 1, the state of Washington adopted a new highway code consolidating all previous road laws and governing state, county and city road construction and maintenance.

Four separate laws are embodied in the code—the motor vehicle act, the license act, the state highway act, and the state-aid highway act governing roads and streets not in either primary or secondary highway systems.

Selection, construction and maintenance of all roads financed in part by federal aid will be controlled by the director of highways who is appointed by the governor. County roads will be

Hi-power ...the Bucket for Excavating

Contractors say "It's the best bucket we've ever used" . . . because it digs deep, fills full and stands up! It will dig BIGGER PAY LOADS for you. *Ask for Bulletin 237.*

WRITE WIRE OR TELEPHONE
HAISS
George Haiss Mfg. Co., Inc., 144th St. & Park Ave., New York

Who, for over 40 years, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Bucket Loaders — Portable Conveyors

Bucyrus-Erie built dredge equipment has long proven its dependable, economical performance on this 20-inch, electric, hydraulic dredge "Calumet." It will pay you to investigate Bucyrus-Erie quality, service, and price whenever you need dippers, winches, pumps, booms, sticks, spuds or other units for dipper, hydraulic, ladder, or alluvial mining dredges.

BUCYRUS ERIE

EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT... SOUTH MILWAUKEE, WISCONSIN, U.S.A.

When writing to the advertisers on this page, you will find a card bound in this issue.

For TEN times more Diesel Service Hours- SINCLAIR TEN-OL

Would you like to operate your "Caterpillar" Diesel engines ten times longer between shutdowns, without stuck piston rings or heavy wear on cylinder liners? Then use Ten-ol, the *new* alloyed Diesel engine lubricant developed for "Caterpillar" Diesels by Sinclair.

Besides multiplying service hours between shutdowns by ten, Sinclair Ten-ol cuts your "Caterpillar" Diesel overhaul costs by 90%. Ten-ol is recommended by the Caterpillar Tractor Co. as a "new outstanding Diesel engine lubricant".

Order Sinclair Ten-ol, Sinclair Diesel Fuel and other Sinclair products from your local Sinclair office or write Sinclair Refining Company (Inc.), 630 Fifth Ave., New York City.

Sinclair Ten-ol lubricated this official "Caterpillar" Diesel test engine in a continuous 1093-hour accelerated wear test at the Sinclair Bureau of Standards. The above unretouched photograph shows engine taken down for inspection. Note perfect condition of rings and piston, and the cleanliness of the crankcase after draining. Compare with piston at right.

The finest grade of straight mineral oil was used to lubricate the above piston in a "Caterpillar" Diesel engine during a continuous acceleration test only 1/10 as long as the test described at left. Note in unretouched photo signs of blow-by indicating poor piston seal, carbon-coated piston crown, sludge, plugged oil control rings and gum on piston skirt.

More Yardage— *More Profit!*

A quicker fill . . . a smoother carry . . . a cleaner dump—these are features that help make RED ARCH buckets the most profitable to use on your drag-line. Long life, under hard digging, is realized by use of strong, light, alloy steels; tough, rigid arch; extra strong lip; free running, oil-pocket, guarded dump-sheave; and flexible drag-chain hitch. Teeth are reversible and easily removed for sharpening or replacement. Write for bulletins fully illustrating the many other extra-value features of RED ARCH drag-line buckets. Three types . . . sizes ⅜ to 14 yards.

BUCYRUS ERIE

BUCYRUS-ERIE

EXCAVATING, DRILLING & MATERIAL-HANDLING EQUIPMENT • • SOUTH MILWAUKEE, WIS.

● **The increase in building construction has meant plenty of work digging basements for small-shovel owners. Here R. D. Sidley's 3/8-yard rig is handling a cellar job in Thompson, Ohio.**

controlled by county commissioners, with direction and approval of the state highway director. Each county will have an experienced and qualified road engineer.

Further provisions of the code govern amount of day labor per job, regulations for awarding contracts, preparation of plans and estimates, and reports of expenditures.

Highway Safety Study

A comprehensive program of research into the causes of highway accidents is now under way according to a report to Congress by the Secretary of Agriculture on work being done under an authorization of $75,000 for safety studies made at the last session of Congress.

The Bureau of Public Roads, acting for the Secretary of Agriculture, is cooperating with nationally recognized agencies in the field of highway safety in attacking the problem on numerous fronts.

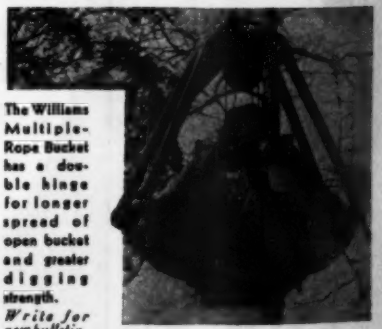
Particular attention is being given three phases of the highway safety problem: (1) Detailed study of the lack of uniformity in State motor-vehicle laws, which is regarded as an important contributing cause of highway accidents; (2) Study of the characteristics and habits of drivers and identification of dangerous drivers; and (3) Improvement of the basic data needed for the study of accident causes and prevention. Accident reporting is to receive particular attention.

All available information relating to drivers is being collected for study. A digest of the results of previous research is expected to throw light upon means of detecting those personal traits that predispose individual drivers to accidents and that point to means of controlling drivers with such traits.

The Bureau reports that the accident expectancy of the average driver is one accident in about 25 years. Therefore, drivers who have accidents more frequently should be detected and watched. One step in this direction will be the collection and study of accident

(*Continued on page 304*)

DIG *faster* with a WILLIAMS



The Williams Multiple-Rope Bucket has a double hinge for longer spread of open bucket and greater digging strength. *Write for new bulletin.*

The Wellman Engineering Co.
7002 CENTRAL AVE., CLEVELAND, OHIO

WILLIAMS
POWER-ARM, POWER-WHEEL, MULTIPLE-ROPE DRAGLINE ..... *buckets*

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LINN
gives you all three!

LINN PRODUCTS ARE PATENTED

If the job is big . . . if haulage conditions are tough . . . if the time limit is short . . . be sure the haulage is LINN. For no other type of haulage unit combines all the features . . . all the time and money saving advantages . . . which LINN supplies. Its flexible traction unit provides unequaled traction . . . enabling LINN to operate in weather and over footing that keeps most other equipment idle; and to negotiate steep grades with heavy loads.

Conventional steering wheel, clutch and brake, make for simple, easy driving. The high speed of LINN, coupled with massive bodies of all types ranging in capacities up to 15 yards, means more trips per day and more yards per trip. And the massive power supplied by proved gasoline or Diesel engines assures dependability under all conditions . . . and lowest operating costs. No matter what your haulage requirement, it will pay you to investigate the LINN. Descriptive bulletins, relative to LINN haulage costs, are freely offered.

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Portland, Ore.
Providence, R. I.
Roanoke, Virginia
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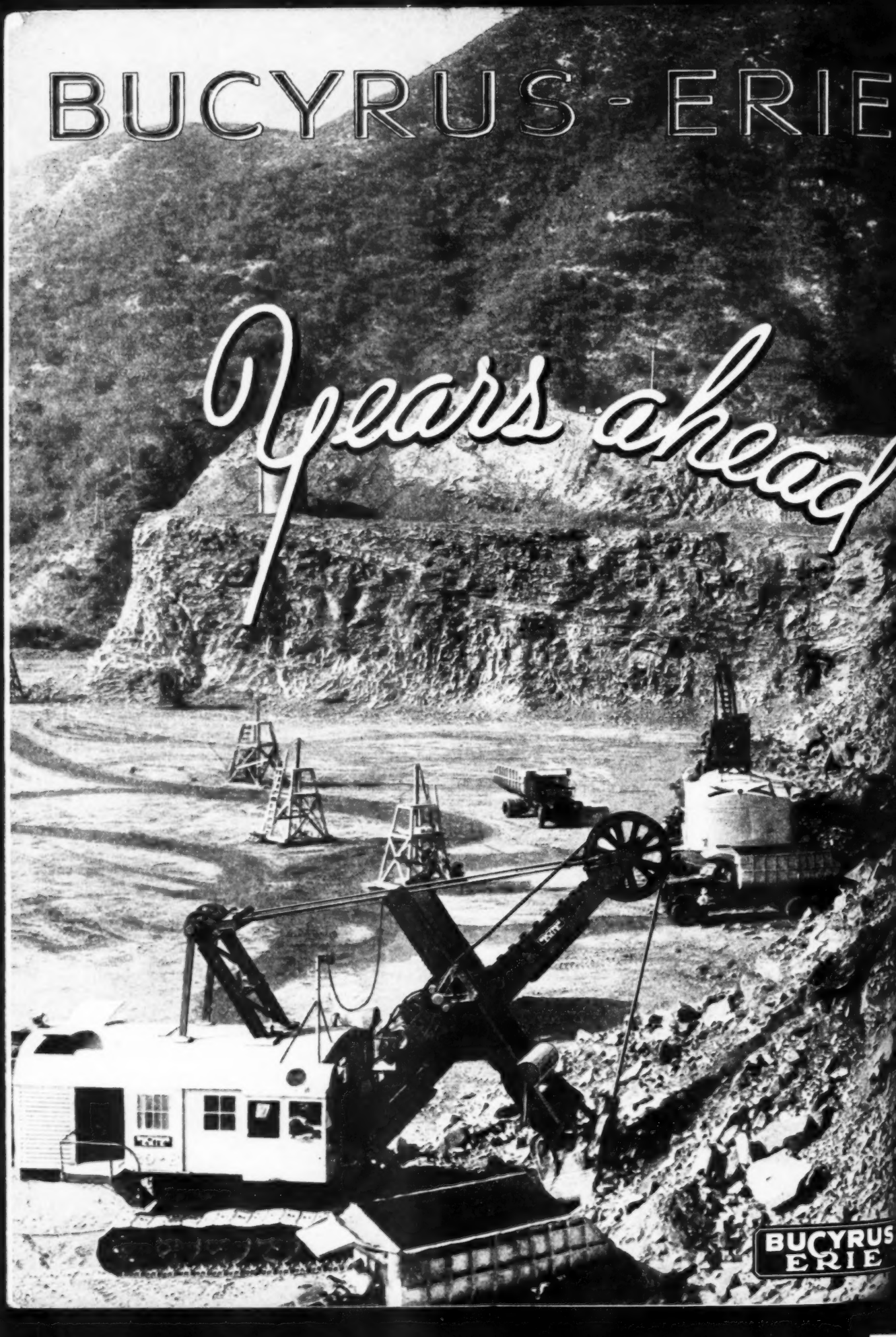
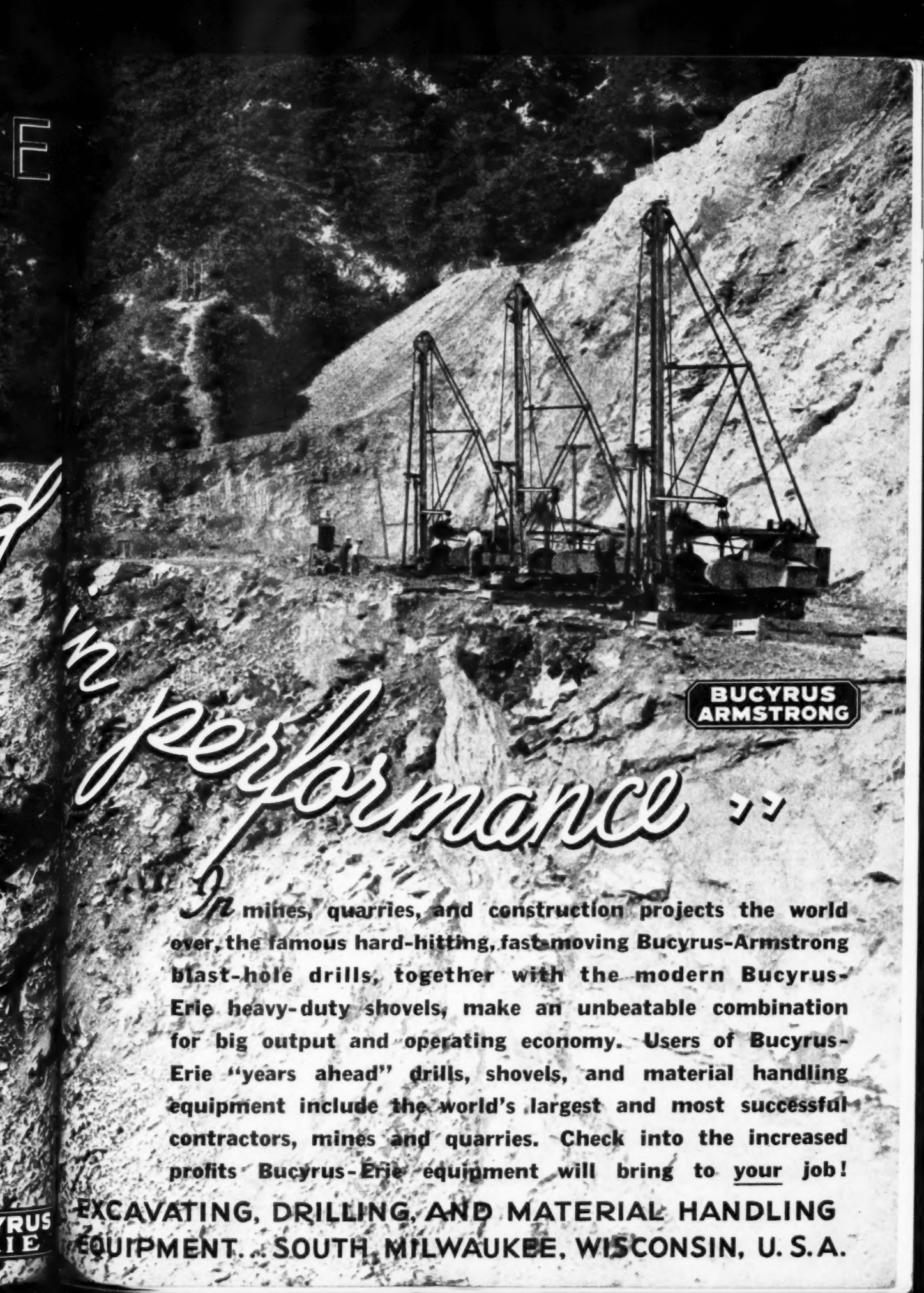
For your convenience in writing to The Linn Manufacturing Corporation, you will find a card bound in this issue.


BUCYRUS-ERIE
years ahead
BUCYRUS
ERIE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ARMSTRONG
"...performance"
In mines, quarries, and construction projects the world over, the famous hard-hitting, fast-moving Bucyrus-Armstrong blast-hole drills, together with the modern Bucyrus-Erie heavy-duty shovels, make an unbeatable combination for big output and operating economy. Users of Bucyrus-Erie "years ahead" drills, shovels, and material handling equipment include the world's largest and most successful contractors, mines and quarries. Check into the increased profits Bucyrus-Erie equipment will bring to your job!
EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT... SOUTH MILWAUKEE, WISCONSIN, U. S. A.

Shots from the Firing Line

(*Continued from page 300*)

records of 25,000 drivers over the past 6 years. This study will reveal what percentage of drivers menace the safety of themselves and others. It also will show whether data now collected furnish an adequate basis for predicting the driver's future performance.

Physical and psychological tests of drivers also are to be made to measure skills assumed to be essential to safe driving. By measuring the skill and driving ability of numerous drivers, and comparing the results with their accident records, it may be possible to develop methods that will positively identify safe and unsafe drivers. Such methods could be used by authorities in issuing, suspending, and revoking driver permits.

Black Canyon Canal Award

Award of the contract covering construction of eight miles of the Black Canyon Canal, Payette Division, Boise project, to J. A. Terteling and Sons of Boise, Idaho, on their bid of $184,007, has been made.

The successful bid was the lowest of sixteen proposals received and opened by the Bureau of Reclamation at its Boise office, March 12.

In addition to excavation of the canal, this contract will cover lining of a portion of the canal and structures and construction of bridges and other small structures.

Foreman's Ingenuity Cuts Bridge Cost

Ingenious devices have been employed by many foremen on construction projects of the Works Progress Administration in various parts of the country. This fact is revealed by examination of many narrative reports from state WPA offices which have been received from time to time by the Information Service of the WPA at Washington, D. C., headquarters.

Harnessing the forces of nature to help, and thereby reducing the cost of a bridge construction project, is illustrated in the case of work recently done by a WPA foreman and his crew on Bear Creek, near Walsh, Colorado. The very forces—flood water and sand silting—which it was feared would run up the expense of the project were in fact employed to speed up the work and reduce the expense.

"An interesting oddity in project operation," says the Colorado report, "has been carried out successfully in constructing a bridge over Bear Creek, one mile north of Walsh on the Walsh-Holly road.

"The project involved the construction of a four-barrel bridge with 16-foot arches of stone masonry. George Steen was the foreman.

"Due to the sandy condition of the creek bed in times of flush run-off, Bear Creek carries a heavy burden of sand. The foreman knew that if, while he was making his excavations for footings, a heavy rain caused a run-off in this stream the work would be lost unless expensive, sand-tight coffer dams were built. He threw a small dam across the arroya above the bridge location at a point where the flow of water over the crest of the dam would pitch down on the bottom of the arroya at the location of the foundation.

"Rains did come and this run-off deposited above the dam more than enough sand for the construction work of the bridge while at the same time the water pitch over the dam excavated the field below to an average depth of less than three feet above the footings of the bridge. This made it possible to easily excavate and start these footings with much of the work already done by the stream. The deposit of sand above the dam was handy for construction purposes. The materials used in the dam were then removed and completely salvaged for other purposes.

"An additional ingenious operation was in the cutting and placing of the stone. For safe operation stone was cut ready for laying in the bridge on the high ground so that any freshet would not cause a loss. Then to facilitate the placement an overhead tram was rigged up between two tripods and an ordinary hay track car with a cable and bucket attached transported the stone from where it was cut to the foundation, by the use of an improvised gasoline hoist built from an automobile engine."

Anti-Diversion Progress

The nation-wide "sit-down" strike by automobile and truck owners against

HERE'S WHY —

● Rex Speed Prime Pumps have the only Positive Recirculation Cutoff — Completely Automatic Prime Control — Greatest Air-Handling Ability — advantages that mean greater profits for you and their continued success at the job of pumping thousands of gallons at lowest possible unit cost. The Rex Line is a complete line — there are sizes to meet the demands of any job — large or small. Wheelbarrow, skid, 2- or 4-wheel trailer mountings, plus lightweight though sturdy design, make it easy to spot them "close to the hole." You pump at a profit when you're working with Rex!

Send for the 1937 Speed Prime Pump Bulletin.

CHAIN BELT COMPANY, 1652 W. Bruce St., Milwaukee, Wis.

REX CHAIN BELT COMPANY of MILWAUKEE
Speed Prime Pumps

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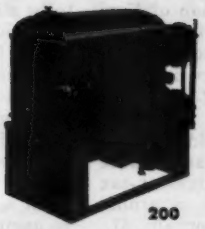
INTERNATIONAL ENGINES

Cut Power Costs

P-12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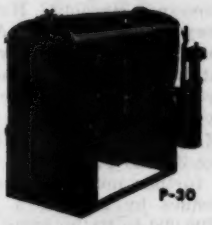
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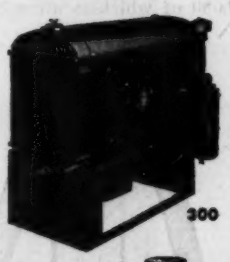
Brief Specifications

INTERNATIONAL POWER UNITS

Model	No. Cylinders	Max. Horsepower	Cont. Load Horsepower—80% of Max. H. P.	R. P. M.
P-12	4	22.5	18	1400 and 2000
200	4	33.5	26.8	1000
P-30	4	39.5	31.6	1150
300	4	47	37.6	1050
PA-40	6	59.5	47.6	1400 and 1800
PD-40 Diesel	4	62.5	50	1250
PA-50	6	66.5	53.2	1400 and 1800
PD-80 Diesel	6	100	80	1400
PA-100	6	106	85	1400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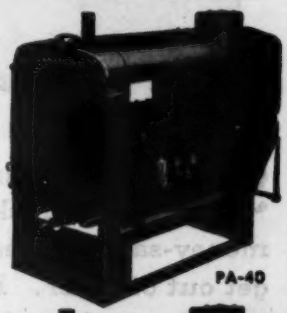
INTERNATIONAL ENGINES can easily become a most important factor in your business. That's the experience of others—and it is the best guide to follow when you need industrial power.

International Engines are used in many different ways. For stationary work, these rugged, dependable, multi-cylinder engines are built into the compact power units shown here. The line includes 4 and 6-cylinder power units for *gasoline, kerosene, distillate,* or *natural gas,* and 4 and 6-cylinder *Diesel* power units. Sizes range from 12 to more than 100 h.p.

These efficient engines are also built into International Wheel Tractors and TracTracTors (crawlers) for heavy work in industry and commerce. And they are widely used by well-established manufacturers to power road machinery, locomotives, shovels, lighting plants, and many other type: of equipment. They are backed by International Harvester's more than 30 years of experience building engines, tractors, and motor trucks, and by a network of distribution and service. The nearby International Industrial Power dealer or Company-owned branch will give you specifications, prices, and other information on request.

PD-40 DIESEL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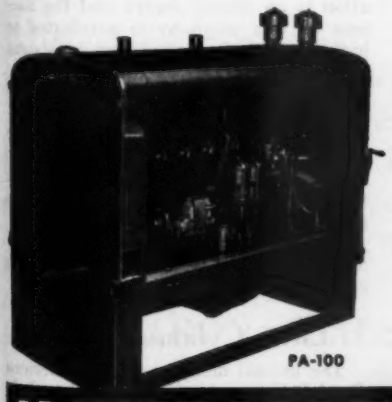
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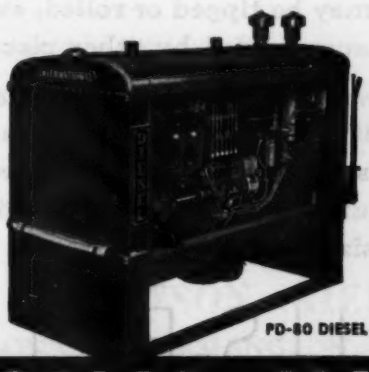

PD-80 DIESEL

PA-50

INTERNATIONAL HARVESTER

For your convenience in writing to International Harvester Company, you will find a card bound in this issue.

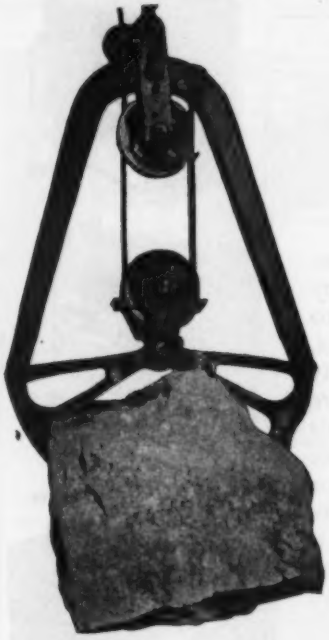
the continued misappropriation of gasoline and motor-vehicle highway-tax money paid by them for the building and upkeep of good and safe state roads has won for them decisive victories on two important fronts, according to the American Road Builders Association.

Governor Harold G. Hoffman of New Jersey vetoed a bill on April 5 which, if passed, would have diverted approximately eight million dollars in highway-tax funds to the relief of unemployment in that state.

Maryland's legislature decided on the same day to put an end to any chance for further misuse of its highway-tax revenues by passing a bill returning $3,300,000 to its highway program, $1,300,000 of which is already earmarked for specific road projects. This money had been slated for diversion to balance the state budget and caused Maryland to be the first state to be penalized by the federal government as provided by authority of Section 12 of the Hayden-Cartwright Road Act. Notified that one-third, or $341,666 was to be sliced from the state's federal-aid apportionment for its highway program, Maryland decided to reconsider and passed the bill restoring sufficient funds to its highway program to eliminate imposition of the diversion penalty by Uncle Sam.

In vetoing the New Jersey bill proposing the diversion of approximately eight million dollars in highway money to unemployment relief, Governor Hoffman issued a statement of opinion.

"A popular cry of the pro-diversionists has been 'concrete or bread'. Like the slogan 'economy before new taxes,' this does not represent a policy, but a shibboleth designed to make a popular appeal and to facilitate elections. The real issue is between a melodramatic slogan, 'Concrete or Bread,' and a sound policy that will provide both 'Concrete and Bread.' Work upon our highways provides honest bread for honest workers who are creating capital assets that will be useful to them and to their children. Diversion for relief purposes provides, on the other hand, crusts of charity for people who cannot find work, or who will not work. We must feed the hungry until they can feed themselves. Our real obligation is to create jobs and opportunities to earn, not to perpetuate unemployment."



A better way to handle ROCK

This remarkable unit is offered in five sizes, 2½, 5, 10, 15, or 20 ton.

SIMPLE and sure, this Bucyrus-Erie Rock Grab solves your rock moving problems with modern, money-saving speed. There is nothing to wear out or get out of order. Rock may be tipped or rolled, even picked up when closely surrounded by other pieces.

Its positive grab does away with slings and auxiliary equipment. Your load is laid down exactly in place, without resetting. This is a winner that deserves your attention when your problems involve loading rip rap or handling oversize with a crane. 820F

BUCYRUS-ERIE

EXCAVATING, DRILLING & MATERIAL HANDLING EQUIPMENT
SOUTH MILWAUKEE, WISCONSIN

BUCYRUS ERIE

All American Canal Crossing Awards

Lewis-Chambers Construction Company has been awarded contract for construction of three highway crossings and one railroad crossing over the All-American Canal in the vicinity of Calexico, California, on its bid of $106,528.50. The successful bid was the lowest of sixteen proposals received and opened by the Bureau of Reclamation at its Yuma, Arizona, office December 29.

The siphons and bridges involved are those which will serve the Calexico-Yuma highway about two miles northeast of Calexico; Imperial Avenue one mile north of Calexico; the Calexico-Seeley highway two miles west of Calexico; and the main line Southern Pacific Railroad and the highway one mile northwest of Calexico. Suitable detours will be provided during the construction period.

Chain Company Anniversary

In June, 1937, the S. G. Taylor Chain Company of Hammond, Indiana, will celebrate their 64th anniversary, having been established in 1873.

Sixty-four years of continuous operation is an unsual record and the success of this company is attributed to high quality of product and consistent sales policy.

E. Winthrop Taylor, president, is of the third generation of the Taylor family in the active management of the business, his father, S. G. Taylor, Jr., being chairman of the Board. The first S. G. Taylor passed away many years ago.

The company makes a complete line of iron and steel welded chain, also, tire chains and accessories.

A.R.B.A. Annual Meeting

The annual meeting of the American Road Builders Association will be held in Washington, D. C., on May 26, 27 and 28. Annual meetings of the City and County Highway Officials Divi-

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

FOR SALE

60 INCH BELT CONVEYOR

USED ON

GRAND COULEE DAM

This complete Jeffrey unit now offered consists of approximately one mile of 60-inch conveyor line with latest type troughing and return idlers, four apron feeders, 20 drive units, using 200 h.p. continuous load, 440 volt, 700 r.p.m. motors with reversing contactor panels, V-belt drive pulleys, 20 terminal stations, 175-ft. boom stacker and several thousand feet of good used 60-inch belt.

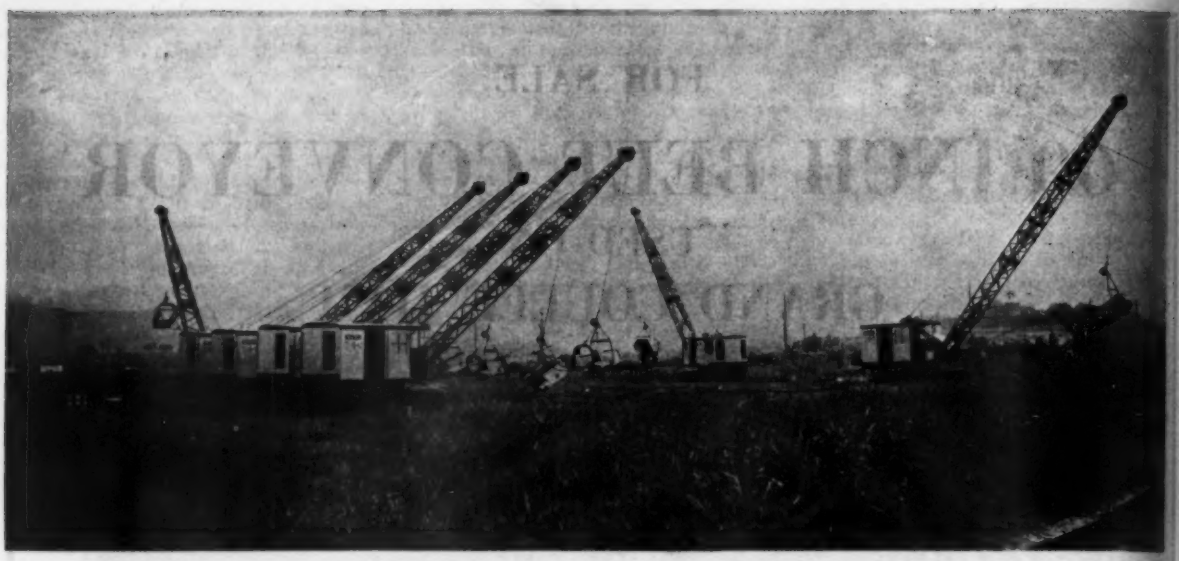
We feel that this Belt Conveyor should be suitable for large excavating, mining or stripping operations generally and the purpose of this advertisement is to solicit prompt inquiries from any parties interested in its purchase as a whole. If we do not receive satisfactory offers for the entire equipment we will sell it in units, and will be pleased to receive any inquiries on this basis also. Write, wire or phone the undersigned.

MASON - WALSH - ATKINSON - KIER COMPANY

MASON CITY, WASHINGTON

Please write us if interested in any items of excavating or other equipment now available.

For your convenience in writing to Mason-Walsh-Atkinson-Kier Company, you will find a card bound in this issue.



sions will be held at the same time. Incoming officers and directors will take office, and plans will be developed for the work of various A.R.B.A. and division committees.

The Manufacturers Division will meet on May 26, to discuss the 1938 road show, as well as cooperative equipment and material committees with the A.R.B.A.

● **This unusual view shows seven of eight Bucyrus-Erie 34-BE draglines recently purchased by the Directoria de Saneamento da Baixada Fluminense in Brazil. The machines will be used to widen existing drainage canals and excavate a network of new ones in the low-lying "Baixada Fluminense" area outside Rio de Janeiro.**

Amy: "What color dress are you wearing to the dance?"

Mable: "Red — we're supposed to wear something that matches the color of our boy friend's hair."

Amy: "That lets me out."

Mabel: "Why?"

Amy: "Hell, Jimmie's bald as an egg."

HAYWARD BUCKETS

WON'T QUIT
OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

Here Is a Bargain
in used excavating equipment
(taken from page 318)

BUCYRUS-ERIE 14-B COMBINATION ½ yd. shovel and drag shovel. Used as shovel three days—as drag shovel five weeks. Practically new condition. Located Eastern Pennsylvania. Box 992-SS.

For other bargains in shovels, draglines, cranes, locomotives, trenchers, and miscellaneous contractors' equipment turn to pages 318 to 322.

The largest listing of Used Equipment offered by any Publication Serving the Excavating Industry.

Sauerman Cableway Excavator lifts gravel from bottom of bay to an elevated grizzly.

SAUERMAN
LONG RANGE MACHINES

In the Sauerman line of Drag Scrapers, Slackline Scrapers and Cableway Excavators there are machines to solve every problem—large or small—in pit or bank excavation, river dredging, stripping overburden, storing and reclaiming sand, gravel, coal, ore, etc.

Several hundred installations of varied sizes and types are illustrated and described in our new Catalog 18. Write for your copy of this catalog now.

SAUERMAN BROS., 474 S. Clinton St., Chicago

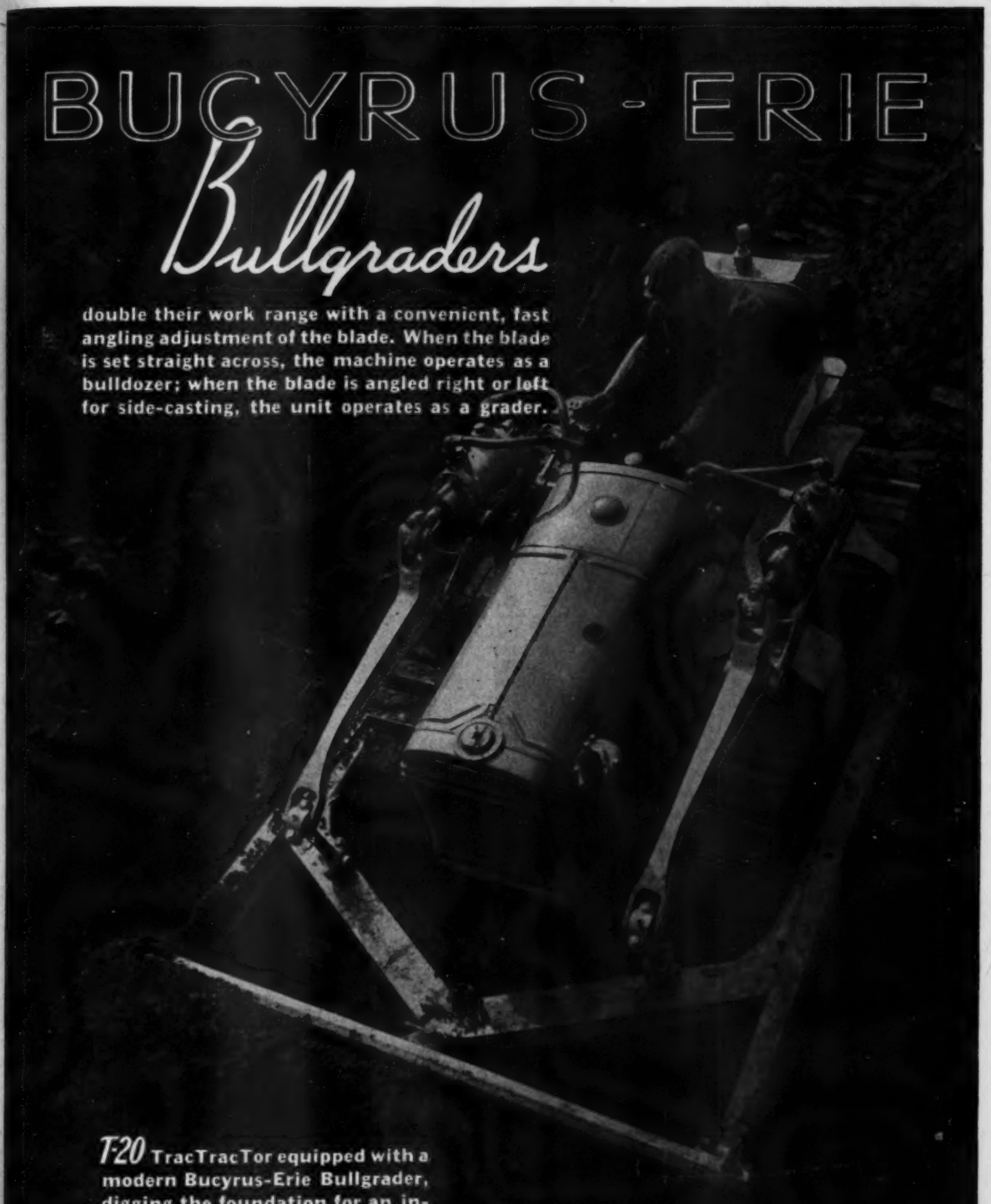
Sauerman Scraper drags gravel from midstream to repair eroded bank of river.

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

BUCYRUS-ERIE

Bullgraders

double their work range with a convenient, fast angling adjustment of the blade. When the blade is set straight across, the machine operates as a bulldozer; when the blade is angled right or left for side-casting, the unit operates as a grader.



T-20 TracTracTor equipped with a modern Bucyrus-Erie Bullgrader, digging the foundation for an industrial plant near Pittsburgh, Pa.

BUCYRUS ERIE

EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT... SOUTH MILWAUKEE, WISCONSIN, U. S. A.

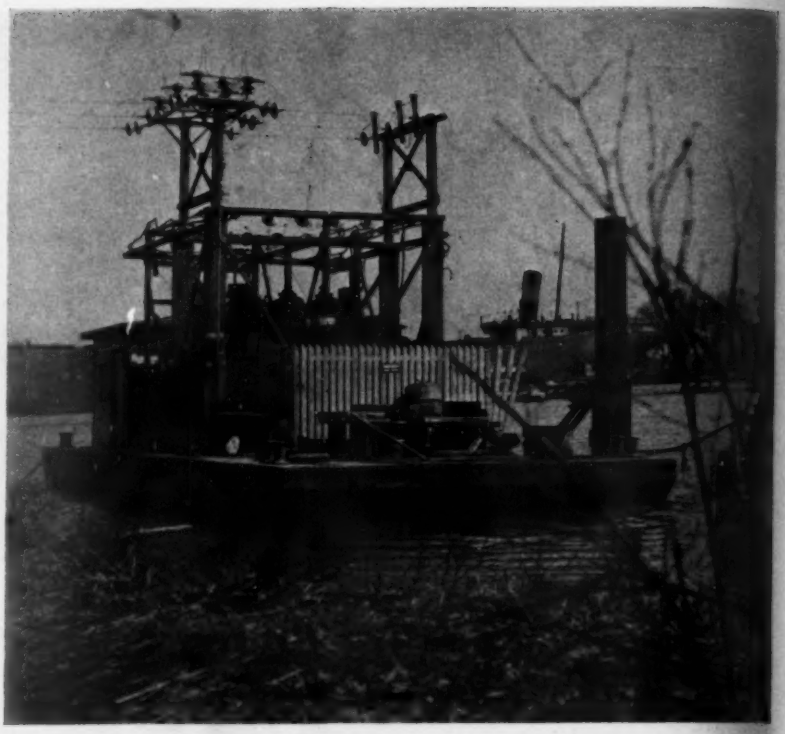
For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

Inland Waterway

(Continued from page 285)

level with the ground, the top section of the "T" acts as a blade giving further resistance to pull. These ingenious anchors will withstand a pull of from 60,000 to 70,000 pounds. With one set on each side of the dredge, and 1¼-inch Leschen cable leading from each to motor-driven drums on the dredge, the cutterhead can be moved across the cut smoothly and strongly.

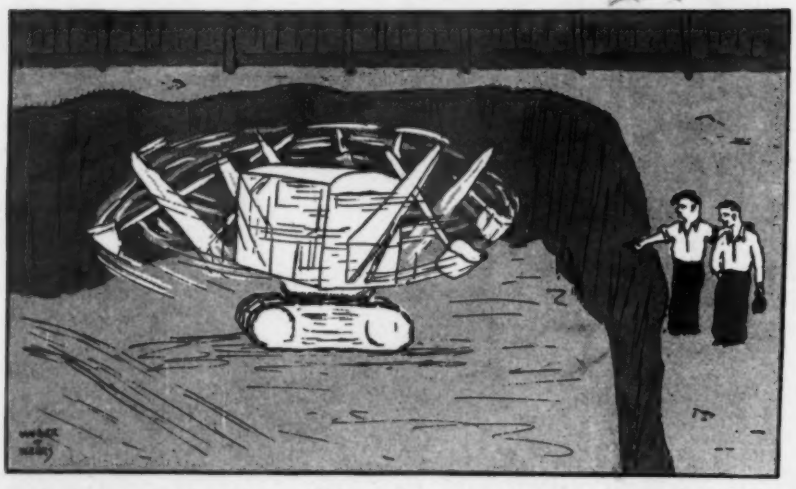
The cut is taken in strips three feet high clear across the width to be dredged. A scale on the upper side of the frame supporting the digging ladder tells the operator just how deep the cutterhead is at any moment. The dredge is moved forward to a new position every time a three-foot advance in the bank has been made. Anchors are shifted when necessary by one of the two Johnson-LaCrosse Caterpillar RD 6's, which are equipped with 10-ton capacity LeTourneau cranes. These rigs are also used for pipe-handling and miscellaneous work about the job. A signal whistle from the dredge calls them when anchor-shifting is necessary. Because of the unusually soft ground over which they have to operate, the tractors are equipped with special 30-inch-wide treads, and 36-inch-wide Athey caterpillar type treads have been substituted for the more ordinary wheels on the cranes.



● This steel barge is the Johnson-La Crosse sub-station. It can be moved as the dredge progresses, and cut in at convenient locations. Power comes in here at 12,000 volts, is stepped down to 4,000.

Despite the tough nature of the material handled—the "Calumet" as well as the dragline is working in the boulder clay—maintenance has not been a serious problem on either job. The dredge was designed with extra power to handle the material and Superintendent Veir says the Bucyrus-Erie pump was chosen because it was the only one they knew which would stand up to the conditions. A Lincoln electric welding outfit, worked two shifts daily, builds up worn dredge runners, and handles necessary repair work.

The boat crews of four men on each shift keep the Calumet spick and span inside and out, providing a regular care which has paid dividends in continued smooth operation. The 43-B dragline is greased once every shift, during the period when the operator is eating his lunch.



"Don't worry, he can stop it. It's just that at lunch time he insists on whipping some cream for his pie."

Personnel

The Al Johnson Construction Company and the LaCrosse Dredging Company are separate firms, combined only on this work. A. M. Thompson, who is also secretary and treasurer of the LaCrosse Dredging Company, is general manager of the Calumet jobs, with headquarters in Minneapolis. E. J. Veir is general superintendent for the combined firms, R. E. Englehart is assistant superintendent, and H. W. Gustafson is office manager. Dredge operators are Pat O'Hanlon, Tom Wicks and Gilbert Cook. Claude Moore, Fred Williams and Charles DeGreve are the three operators on the 43-B dragline.

BUCYRUS-MONIGHAN

can safely work close to the edge of a bank. It rests on its circular base when digging . . . not on its extending traction treads . . . ready to step away at an instant's notice. The ground bearing pressure is lower than that of any other dragline. Manufactured by Bucyrus-Monighan, Chicago, Illinois.

Illustrated: Gravel pit operations on one of Winston Brothers Company jobs in Idaho.

BUCYRUS MONIGHAN

Sold by BUCYRUS-ERIE CO.
SOUTH MILWAUKEE, WISCONSIN, U.S.A.

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

BEACH CITY DAM

(*Continued from page 285*)

point of placement. Each side of the double Pumpcrete has two valves; an inlet valve which opens as the piston retreats through the cylinder and allows the retreating piston to draw a charge of fresh concrete into the cylinder from the remixing hopper; as the piston starts ahead, the outlet valve opens and the inlet valve closes causing the piston to force the concrete in the cylinder out through the outlet valve into the pipe line connection and the concrete already in the pipe-line is forced ahead a distance equal to the length of the stroke of the piston. After the pipe-line has been filled, as much concrete is discharged from the end of the line as is forced in by the piston. A "Y" connection, called a "Siamese" unites the discharge of the two cylinders in a seven inch pipe line which extends to the point of placement.

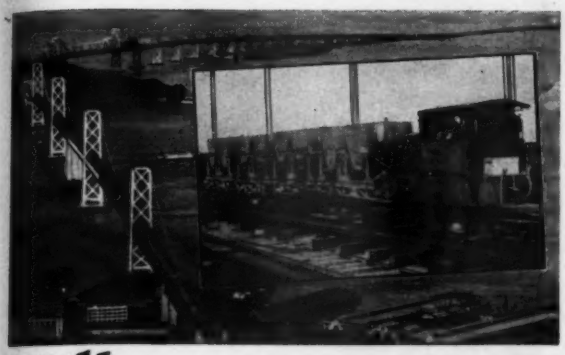
Building Up the Lifts

The placing of concrete in lifts called for the following procedure: the pipe-line was laid along the forms to the far end where concreting was commenced. When the proper height had been reached at this point, a 10-foot section of pipe was removed and concreting went on from the new pipe terminus without interruption. At the completion of the lift, the Pumpcrete was stopped momentarily while the pipe-line was re-assembled by snapping on the quick coupling toggle joints. The Pumpcrete was started again to repeat the operation. When the forms were nearly full, an estimate was made of the concrete required to complete the pour. The concrete in the pipe-line, the remixing hopper of the Pumpcrete and in the mixers was subtracted from the amount required to fill the forms, which determined the number of batches to weigh out. When the last concrete had been withdrawn from the remixing hopper, the pipelines were broken and the Siamese removed, the Pumpcrete was washed out. A Go-Devil was inserted in the pipe line, and by means of compressed air furnished by a diesel driven air compressor, the "Go-Devil" was forced through the line moving the concrete ahead of it. In this way the line was cleared of concrete.

Extremely dry mixes were used which resulted in slumps of one-half to 2 inches. Two internal vibrators were used in the forms to puddle the concrete into final position. From 40 to 60 cubic yards of concrete was placed per hour with a crew of 10 men. This crew erected the pipe-line, uncoupled and reassembled it, operated the vibrators, and puddled

(*Continued on page 316*)

● **Top: A section of the outlet works under construction. The Bucyrus-Erie Gas + Air shown upper left is loading aggregate to the Pumpcrete just to the right and below. Seven inch pipe leads down the bank to the forms. Below: Discharge view showing liquid concrete flowing from Pumpcrete into forms. Two vibrators are being used to puddle the concrete.**



When WHITCOMB LOCOMOTIVES

Performed High Above SAN FRANCISCO BAY

Naturally, the men who designed and built the great San Francisco-Oakland Bridge used the most effective methods and equipment to be had. The photograph shows one of a fleet of Whitcomb Locomotives hauling concrete from the loading hopper to the paving operations on the bridge.

On haulage jobs, large and small -- in mine, quarry, construction work, or factory yard, Whitcomb Locomotives work without waste -- haul more tons per dollar in less time. Backed by two great names -- Whitcomb and Baldwin -- they give you assurance of dependable, uninterrupted service.

The extensive line includes a type and size of Locomotive to suit your needs. Let our engineers survey your haulage problem, and estimate the savings you can make with Whitcomb equipment.

CHOOSE YOUR POWER
Gasoline or Diesel Mechanical Drive
Gasoline or Diesel Electric Drive
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Combination Trolley--Storage Battery

THE WHITCOMB LOCOMOTIVE CO.
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Subsidiary of The Baldwin Locomotive Works.
All sales made by The Baldwin Locomotive Works,
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Post Office, Philadelphia, Pennsylvania.

G-E CABLE OPERATES AT 4 TIMES RATED VOLTAGE

ORDINARILY, you wouldn't think of asking a 600-volt cable to operate on a 2300-volt circuit. And we're not suggesting that you do.

But the following letter tells an interesting story of such a substitution, and it does indicate that this G-E tellurium-rubber cable is a high-grade product.

A letter received by a G-E District Cable Specialist

You will be interested in a recent emergency case in which we had a 2300-volt cable failure on two 125-horsepower fire-pump motors. It is very important to keep these fire-pump motors running seven or eight hours each day, and we suddenly found ourselves without any suitable size of 2300-volt parkway cable or rubber-covered wire.

It so happened, however, that we had on hand 300 feet of Type W, 600-volt, No. 6 stranded, tellurium-compounded all-rubber-covered cable. We immediately connected this as our emergency circuit, and it served the pumps for twenty-four hours while we were searching for something with which to replace it. Since the cable stood it in satisfactory manner, we continued to operate this way for a little over two weeks while new 2300-volt cable was purchased and shipped to us.

This is quite a satisfactory performance, inasmuch as the circuit operated at four times its normal operating voltage over a period of two weeks. I find this cable quite indispensable as an extra supply item for miscellaneous purposes where a flexible cable is wanted, especially for temporary uses. Hence, I thought you would be interested in this case.

Yours very truly,

(Name on request)

IT'S TELLURIUM

Three-conductor, Type W, Portable Cable

For Many Uses—For electric shovels and dredges, for mining machinery, for arc welders, for all sorts of portable equipment, there is a type and size of G-E tellurium-rubber cable that is just suited. For prices and detailed information, see Bulletins GEA-1728 and GEA-1918, which we shall be glad to send you on request to the nearest G-E sales office or General Electric, Dept. 6D-201, Schenectady, N. Y.

GENERAL ELECTRIC

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Not in the Contract

"Read the top line," said the occulist, handing the patient a test card with letters HPTRVZ-BFHK.

Moments went by. The patient stared at the card steadily but blankly. Finally the occulist grew impatient.

"Do you mean to tell me," he barked, "that you can't read letters that size?"

"I can see the letters all right, but I can't pronounce the damned word."

Policeman: "Which of you was driving when you struck the other car?"

Drunken Driver: "None of us. We were all sitting in the back seat."

Doctor: "I don't like to mention it, but that check you gave me has come back."

Contractor: "Well, that sure is funny. So did my lumbago."

She: "You can save my husband from the electric chair."

He: "How?"

She: "Dive through the window and run like hell!"

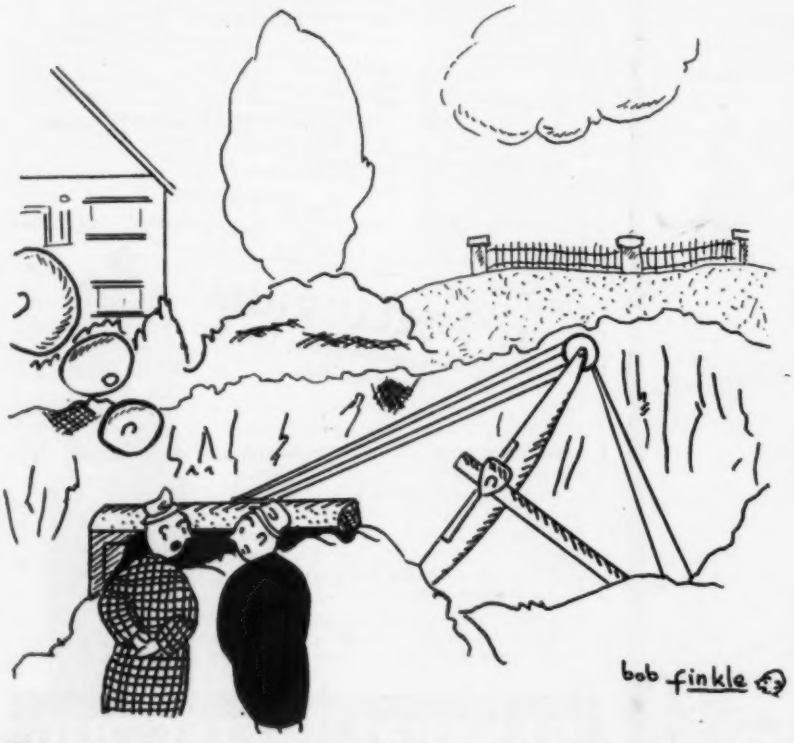
Pretty Caller: "Do you think the superintendent will see me now?"

Bookkeeper: "Certainly, madam, the superintendent always has time to see pretty girls."

Pretty Caller: "Well, tell him that his wife is here."

Dieting is the triumph of mind over platter.

A girl can sing.
A girl can dance,
A girl can play crokay;
But she can't strike a match
On the seat of her pants,
'Cause she just ain't built that way.



"He's going fishing tomorrow, and he borrowed it to dig worms with."

A young woman visiting the zoo was very disappointed to find the monkey cages empty. A keeper explained that it was the monkey's mating season and they stayed in their houses.

"Would they come out if I offered them a peanut?" the young woman asked.

"I don't know, lady," the keeper said. "Would you?"

A doctor has a device to change the human nose. Sticking it where it doesn't belong is one way.

"What color dress did Mabel wear to the party?"

"Don't know, but I think it was checked."

"Some party!"

Never tell a secret around chairs.

Why?

Because chairs are talebearers.

Lucy (to guest): "Do you like that cake, Mrs. Brown?"

Mrs. Brown: "Yes, dear, very much."

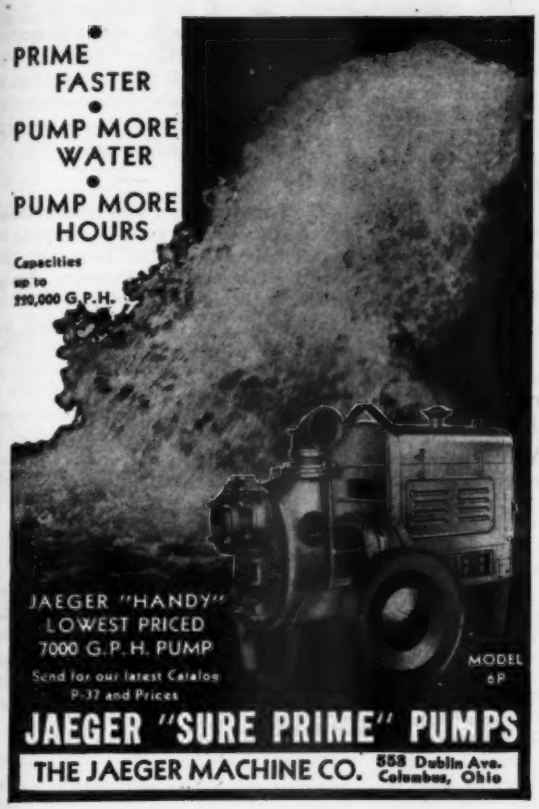
Lucy: "That's funny, 'cause mother said you haven't any taste."

A survey gathered data to show that 50,000 girls have recently returned to cotton-top hose. When at its height, this investigation must have been interesting.

The philanthropist watched as a timid-looking little man tackled two gangling young ruffians who had caught a mouse and were tormenting it. The timid-looking man stroked it fondly, as though to comfort it, than slipped it into his pocket.

"Sir," remarked the philanthropist, "permit me to offer my humble word in praise. I see you cannot bear to think of the smallest or lowliest of creatures suffering."

The timid-looking man stroked the mouse again. "It'll scare hell out of my wife," he said simply.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Serve better—longer

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NOTICE!

THE C. R. JAHN COMPANY

Announces

that their trailers are now being manufactured in

CHICAGO

« « « » » »

This new arrangement makes improved manufacturing facilities possible, assuring better workmanship and a better product.

It enables us to offer a superior trailer at lower costs.

The central location of Chicago provides for lower freight rates and prompt delivery.

If you are in the market for a heavy duty machinery trailer, it will be to your advantage to investigate the improved features that these trailers offer.

C. R. JAHN COMPANY
BUILDERS BUILDING
CHICAGO, : : : ILLINOIS

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Beach City Dam

(*Continued from page 312*)

the concrete. This was possible due to the quick acting toggle joint permitting coupling or dismantling the pipe-line by two men instantly, and to the smooth even flow of concrete at the point desired which eliminated unnecessary handling of the concrete in the forms.

Concrete was delivered to points 800 feet from the mixer, without interfering with other operations or requiring the construction of tracks, runways, overhead cableway systems, or high towers, with a concrete mixing and handling plant designed and located to take advantage of gravity and incorporating the control equipment required on all first class construction projects.

The Beach City Dam was constructed by the Eisenberg organization, under the supervision of Lt.-Col. J. C. Arthur, Jr., U. S. Engineer Corps, District Engineer, and A. M. Philleo, Chief of Construction Operations, Maj. A. C. Leiber, Area Engineer and Edwin Beriswell, Resident Engineer.

BOOK REVIEWS

The Jaeger Machine Company, Columbus, Ohio, has just issued a pictorial folder on their contractors' and road builders' equipment. This survey illustrates and describes Jaeger road pumps, well point pumps, mixers, hoists, pavers, finishers, etc. This folder may be obtained upon request to the manufacturer.

The **"Autobiography of a Hercules Electric Blasting Cap"** is a readable little booklet describing the manufacture and testing of Hercules electric detonators. Manufacturing operations are explained in considerable detail and are profusely illustrated with photographs. The copy is brief, but carefully brings out the salient features of Hercules Electric Blasting Caps.

It is an unusual piece of printing, produced in two colors and the cover is protected with a lacquer made from Hercules Nitrocellulose.

This booklet may be obtained upon request from the Hercules Powder Company, News Bureau, Wilmington, Delaware.

Ingersoll-Rand has recently issued a new booklet, (form 2304) covering the characteristics and uses of Jackbits for drilling rock. It also gives dimensions and prices of Jackbits and Jackrods. A copy can be secured by writing Ingersoll-Rand Company, 11 Broadway, New York, N. Y. or any branch office.

The Economy Pumping Machinery Company, Chicago, Illinois, offers a convenient pocket size new **"Pump Data"** handbook for the solution of pumping problems. The information within its covers answers the familiar questions: What kind of a pump is required? Is a special material needed? What horsepower is needed to drive it? What does the pump cost? What does the motor and control required cost? How do you order or specify the proper equipment?

The material is divided into two equal parts. The first part is made up of sections dealing with the index at the front, while a comprehensive application or "Use Index" near the rear makes the proper selection possible. The second part is devoted to "Engineering Data."

"Goodyear Rims for Pneumatic Tires" is the name of a new bulletin issued by the **Goodyear Tire and Rubber Company**, Akron, Ohio. The first half of the bulletin is devoted to a complete description of all Goodyear Truck Rims, Spacer Bands, and accessories. Throughout the latter part of the book the reader will find information on all of the materials manufactured by this company for use in the agricultural implement industry.

The Department of Commerce, Bureau of The Census has made a complete report on the **"Census of Business; 1935 for the Construction Industry,** having broken it down into divisions of Work Performed, Pay Roll, Personnel, and Cost of Materials, by States and Cities, and Kind of Business. The Contents include Definitions and Specifications of Terms, Businesses, and Disclosures, General Analyses of Construction by Contractors, Charts on Contracts awarded, Work Performed, Salaries & Wages, etc. It may be obtained by writing to the U. S. Dept. of Commerce.

The American Instrument Company, Inc., of Silver Spring, Maryland, announces that its new publication "Soil Testing Instruments and Apparatus" is available without charge, to those who make application and state their company or professional affiliation.

Data concerning the mechanical analysis of soils, with accompanying flow sheet, and a profuse illustration and description of the instruments and apparatus required for making soil tests, feature this new publication.

H. W. Porter & Company, 825 Frelinghuysen Avenue, Newark, N. J., manufacturers of the Therm-O-Tile Underground Steam Conduit System, are distributing a booklet which clearly shows, step-by-step, how to install Therm-O-Tile. On the cover is a detailed two color illustration of the finished product. A copy of the booklet will be mailed upon request.

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Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o EXCAVATING ***at South Milwaukee, Wisconsin***

OPERATOR

Experienced operator desires position; will take work anywhere. Has 17 years' experience; two on shovel work, nine on draglines, two on clamshells, four on cranes. Has operated steam rigs five years, electric two years, gasoline five years, Diesel five years. Prefers work on Bucyrus-Monighan or 41-B, steam or Diesel rig, one to six-yard size. Can do own repair work; 34 years old, married, can furnish good references. Now located in Ohio. Box 8601.

EXPERIENCED OPERATOR

Over 17 years' experience on Erie and Marion steam; Osgood gas; and Keystone excavators. Can do own repair work. Single; will go anywhere. Box 8906

EXPERIENCED OPERATOR

Over 15 years' experience on Thew Diesel, steam and gas shovels and cranes; some experience on Eries, Beyers and Limas. A-1 mechanic, will go anywhere.

Box 8905

EXPERIENCED OPERATOR

Experience covers 15 years as dragline, clamshell operator on Diesel and gasoline machines; levee, highway and canal work. Prefers work on Monighan or Northwest. Single, age 31. Can do own repair work and furnish reliable references. Will go anywhere; now located in Louisiana. Box 8703.

OPERATOR

25 years' experience on all makes of machines, gas, electric, Diesel, and steam. Has done dragline, shovel, crane, and clamshell work. Can do own repairs; furnish best references. Willing to go anywhere. Now located in Ohio. Box 8701.

STEAM SHOVEL OPERATOR

Over 20 years' experience on steam machines on all kinds of construction work. Desire position on any make, size or type steam shovel. Age 50, will go anywhere; now located in Missouri. Can do own repair work and furnish best of references. Box 8801.

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VIRGIN ISLANDS: West India Machinery & Supply Co., San Juan, Puerto Rico.

Ruston-Bucyrus Limited

Headquarters and Works: LINCOLN, ENGLAND

London Office, Imperial House, 15, 17, 19, Kingsway, W. C. 2

ABYSSINIA: W. H. Miles, Esq., 41, Osmond Road, Hove, Sussex, England.
AUSTRALIA: Ruston & Hornsby (Australia), Pty., Ltd., Melbourne, Sidney and Brisbane.
AUSTRIA: "Garbe" Aktiengesellschaft fur Landwirtschaftliche Maschinen und Kraftfahrzeuge, Dresdnerstrasse, 27 Vienna.
BELGIUM: Messrs. Berger-Dutry, 15-D, Allee Verte, Brussels.
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BURMA: William Jacks & Company, P. O. Box 83, 517 Merchant Street, Rangoon, Burma.
CZECHOSLOVAKIA: Felix Pick, Monartova 2071, Prague XVI.
DENMARK: E. T. Grew, Raadmansgade 43, Copenhagen.
EGYPT: The Tractor Company of Egypt, S. A. E., P. O. Box 806, Cairo.
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UNION OF SOUTH AFRICA: Hubert Davies & Co., Ltd., P. O. Box 1886, Johannesburg, Transvaal.
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Local distributors in principal countries on the following continents: Europe, Africa, Asia (except Japan and China) Australasia and New Zealand.

Bucyrus-Monighan Co.

Works: Chicago, Ill.

Products sold exclusively by Bucyrus-Erie Company, Ruston-Bucyrus Limited and their distributors.

BUCYRUS ERIE

Trade Notes

The Seattle office of **Bucyrus-Erie Company**, South Milwaukee, Wisconsin, is now located at 3408 1st Avenue, South, Seattle, Washington.

Bucyrus-Erie has also appointed **James W. Bell, Cedar Rapids, Iowa**, as its new distributor in that territory. The James W. Bell Company will cover the majority of the state of Iowa except for the extreme western area, and will carry the smaller machines in the Bucyrus-Erie line as well as a stock of repair parts.

F. H. Hopkins & Co., Ltd., distributors for Bucyrus-Erie Company, South Milwaukee, Wis., announce their location in new quarters at 340 Canada Cement Bldg., Phillips Square, Montreal, Quebec, Canada.

Ransome Concrete Machinery Co., of Dunellen, N. J., announces the appointment of the following firms to handle their line of concrete mixing and handling equipment: Brown-Strauss Corp., Kansas City, Mo.; Shovel Supply Co., Dallas, Texas; Highway Equipment Company, Cincinnati, Ohio; Contractors Machinery & Supply Co., Chattanooga, Tenn.; Dakota Tractor & Equipment Co., Fargo, N. D.; H. B. Faith Equipment Co., Rockford, Ill.

W. C. Slee was recently appointed Assistant Engineer-Director of the American Road Builders' Association, Washington, D. C.

W. D. Ball, 600½ W. Madison St., Ottawa, Ill., recently has become associated with the **Tractor & Equipment Co.**, Chicago, Ill., as District Representative in LaSalle and adjoining counties.

Two appointments to the sales staff of its New York Office, 330 West 42nd Street, are announced by **The Lincoln Electric Company**, Cleveland, Ohio.

The men appointed are W. H. Borst, graduate in mechanical engineering from the University of Illinois, and E. A. Webber, formerly with the company's Chicago office. The new men will assist G. N. Bull, manager, and F. H. Andrews, S. G. Morris and J. B. Chamberlain, members of the New York office staff in providing welding consultation service on all phases of welding.

The C. R. Jahn Company announces that their trailers are now being manufactured in Chicago and no longer at La Crosse, Wis. The central location of Chicago makes possible much lower freight rates and prompter delivery. The new location is Builders Building, Chicago.

A. W. Benn has been appointed sales manager in the new St. Louis territory of the Harnischfeger Corporation. He will handle the sales of the P&H Hansen Smootharc Welders and the new Smootharc Welding Rod. Mr. Benn was formerly connected with the Keasbe-Mattison Company.

FOR SALE

RATES

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Address all box numbers c/o* EXCAVATING *at South Milwaukee, Wisconsin

SMALL SHOVELS
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B GAS Combination Shovel and Dragline. Electric Starter. Battery lighting equipment, ⅜-yard drag bucket. 14-in. caterpillar treads. Approximately one year old. Excellent condition. Located Iowa. Box 1064-SS

BUCYRUS-ERIE 10-B standard gas shovel. 1½ years old. Good condition. Located Eastern Pennsylvania. Box 991-SS.

BUCYRUS-ERIE 10-B TRAILER—Traveled less than 100 miles. Good as new. Bargain price. Box 1078-SS

BUCYRUS-ERIE TRAILER for 10-B machine, less than year old. Excellent condition. Located Western Pa. Bargain price. Box 1001-SS.

INSLEY — TYPE C — GASOLINE SHOVEL. Engine recently rebored and reconditioned. Machine generally in good operating and mechanical condition. Equipped with Buda type KTU Diesel engine. Located Arkansas. Box 814-SS.

½-YARD

BUCYRUS-ERIE 14-B GAS SHOVEL. 16'-6" boom—12'-6" dipper handle—½ cu. yd. cast front inserted tooth dipper. Waukesha 6 cylinder 3¾"x4¾" gasoline engine. Excellent condition. Will demonstrate. Located western New York State. Box 930-SS

BUCYRUS-ERIE 1020 gas shovel and dragshovel. 18' shovel boom. 13' shovel dipper handle. ½ yard shovel dipper. Dragshovel equipment ½ yard front opening type of dipper. Electric starter. Waukesha DR 4 cylinder gas engine. Reported in good operating condition. Located Rhode Island. Box 956-SS.

BUCYRUS-ERIE 14-B COMBINATION ½ yd. shovel and drag shovel. Used as shovel three days—as drag shovel five weeks. Practically new condition. Located Eastern Pennsylvania. Box 992-SS.

BUCYRUS-ERIE 1020 Gasoline Positive Crowd Shovel. 18-ft. boom, 13-ft. dipper handle, ½-yard dipper. Waukesha D.R. 4-cylinder engine. Fair condition. Will demonstrate. Located Western New York state. Box 1073-SS

GENERAL GAS SHOVEL and 35' boom dragline including ½ yd. Esco drag bucket. First class mechanical and operating condition. Located Kansas. Box 993-SS.

P & H MODEL 204 GAS combination ½ yd. shovel and 42' boom crane. Waukesha 4 cylinder 5"x6¼" engine. Good condition considering age. Located San Francisco. Box 1005-SS.

⅝-YARD

BUCYRUS-ERIE Type A steam shovel. 16' boom. 12'-6" dipper handle. ⅝ yard shallow cut dipper. Two speed propelling mechanism. Hand operated boom hoist. Located vicinity New York. Box 958-SS.

SPEEDER — MODEL B-3 — GAS SHOVEL equipped with ⅝ yard Dipper. Located near Boston. Box 1012-SS.

¾-YARD

AMERICAN STEAM SHOVEL. Oil burning. Caterpillar mounted. Main machinery and boiler very good. Balance of machinery needs some repairs. Located Arkansas. Box 965-SS.

BUCYRUS-ERIE TYPE B high lift steam shovel and crane. 19'-6" shovel boom. 16' dipper handle. ¾ yard dipper. 42' crane boom. Located Virginia. Box 961-SS.

BUCYRUS-ERIE TYPE B steam shovel. High lift. Boiler reported good condition and machinery generally in fair condition. Located Rockford, Illinois. Box 963-SS.

If You Do Not Find What You Want Listed—Write Us

EXCAVATING
South Milwaukee, Wis.

BUCYRUS-ERIE TYPE B STEAM COMBINATION SHOVEL-CLAMSHELL AND STEAM HOE. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SS.

BUCYRUS-ERIE (2) TYPE "B" HIGH LIFT Caterpillar mounted Steam Shovels. Good operating condition. Located Eastern Pennsylvania. Box 1014-SS.

BUCYRUS-ERIE TYPE B Steam shovel, caterpillar mounted. Located Indiana. Box 969-SS.

BUCYRUS-ERIE 20-B COMBINATION STEAM SHOVEL - CLAMSHELL - DRAGLINE. Good working condition. Caterpillar mounted. Located Racine, Wis. Box 701-SS.

BUCYRUS-ERIE TYPE B STANDARD ¾ YARD STEAM SHOVEL—Quarry type Dipper — Caterpillar mounted. Good operating condition. Located Georgia. Box 752-SS.

TYPE B BUCYRUS-ERIE HIGH LIFT STEAM SHOVEL 21'3" boom, 18'4" dipper handle. ¾ cubic yard inserted Tooth Dipper—Power Boom Hoist—Boiler Feed Pump—Caterpillar mounted. Located Chicago. Box 699-SS.

BUCYRUS-ERIE MODEL 1030 gasoline shovel. 20'-6" boom, 13'-6" dipper handle. ⅞ cubic yard dipper. Reported good condition. Located Minnesota. Box 964-SS.

FOR SALE

Address all box numbers c/o EXCAVATING *at South Milwaukee, Wisconsin*

BUCYRUS-ERIE 1030 gasoline shovel and clamshell. 23' shovel boom. 15' dipper handle ¾ yard dipper. 35' clamshell boom and Owen "M" Model 230 clamshell bucket. Wisconsin B-3 gasoline engine. Cylinder blocks recently rebored. Machine in fair condition. Located Massachusetts. Box 982-SS.

BUCYRUS-ERIE TYPE B high lift steam shovel and 40' clamshell boom including front drum and gearing. Good working condition. Located Eastern Pennsylvania. Low price. Box 865-SS.

BUCYRUS-ERIE TYPE B HIGH LIFT STEAM SHOVEL. Caterpillar mounted. Good operating condition. Located New Haven, Connecticut. Box 776-SS.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

BUCYRUS-ERIE TYPE B high lift steam shovel. Excellent operating condition. Located Seattle, Washington. Box 943-SS.

BUCYRUS-ERIE TYPE B ¾-yard Steam Shovel and 40-ft. Boom Clamshell equipment including front drum. Caterpillar mounted. Boiler rebuilt 1936. Machinery generally very good condition. Located Chicago. Box 1072-SS

KOEHRING HIGH LIFT—¾-yard gas shovel. Recently overhauled. Brand new engine. Now operating. Price, $3,200. Box 1071-SS

NORTHWEST MODEL 3 GAS SHOVEL. 22'6" Boom, 16'4" Dipper Handle, ¾ yard Dipper. Wisconsin B-3 4-cylinder 5½"x6½" Engine. Has seen very little service. Must be seen to be appreciated. Excellent condition. Located New York. Box 921-SS.

NORTHWEST—MODEL 105, ¾ yard gasoline shovel. Climax 4 cylinder 5½"x7" gasoline engine. Good operating condition. Located Eastern Pa. Box 1015-SS.

OSGOOD MODEL 18 STEAM—¾ yard shovel— Cat mounted. Just completely overhauled. Excellent condition. Located near Indianapolis, Ind. Box 522-SS.

OSGOOD AIR TUNNEL SHOVEL. 13' boom. 8' dipper handle—¾ yard dipper. Located Western New York State. Box 867-SS.

⅞-YARD

BUCYRUS-ERIE—1035 GASOLINE SHOVEL. Chain Crowd. ⅞-yard Dipper. 26-in. caterpillar treads. Electric starter. Needs some repairs. Located vicinity Boston. Box 1065-SS

THREE—BUCYRUS-ERIE B-2. High Lift Steam Shovels. 21 ft. 3 in. booms, 16-ft. dipper handles, 1 1-yd. and 2 ⅞-yd. dippers. Single shaft caterpillars. Late model machines. Recently overhauled. Very good condition. Located vicinity Boston. Box 1075-SS

BUCYRUS-ERIE B-2 High Lift Steam Shovel—Single Shaft Caterpillar—Late Model. Good condition. Located Rhode Island. Box 1076-SS

BUCYRUS-ERIE B-2 High Lift Steam Shovel—Single Shaft Caterpillar. Late Model. Good condition. Located Braintree, Mass. Box 1077-SS

BUCYRUS-ERIE—B-2—HIGH LIFT Caterpillar Mounted Steam Shovel. Good Operating condition. Located Eastern Pennsylvania. Box 1019-SS.

BUCYRUS-ERIE B-2 AIR TUNNEL SHOVEL. 14'6" boom, 10'9" dipper handle—⅞ yard dipper. Located Ohio. Box 869-SS.

MARION MODEL 21—⅞ CUBIC YARD STEAM SHOVEL. Caterpillar mounted. Good working condition. Located Georgia. Box 758-SS.

1-YARD

BUCYRUS-ERIE LATE MODEL B-2 STEAM HIGH LIFT SHOVEL. 1 yard dipper—single shaft cat mounting. Good condition. Located near St. Louis. Box 518-SS.

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL. 19'9" boom—16' dipper handle—1 yard plate dipper. Fair operating condition. Price extremely reasonable. Located Long Island. Box 984-SS.

BUCYRUS-ERIE GA-2 GAS-AIR SHOVEL. 22'6" boom—16' dipper handle—one yard dipper. Waukesha four cylinder 5¾"x8" engine. Overhauled approximately one year ago. Good Fair condition. Located Knoxville, Tennessee. Box 870-SS.

BUCYRUS-ERIE—GA-2 Gas-Air High Lift 1 yard shovel. Air starter. Single Shaft Cat. Fair condition. Located Western New York. Box 994-SS.

BUCYRUS-ERIE GA-2 GAS-AIR SHOVEL 22'6" boom—16' dipper handle—one yard dipper. Electric starter. Waukesha four cylinder 5¾"x8" gas engine. Located Louisville, Kentucky. Box 871-SS.

BUCYRUS-ERIE GA-2 COMBINATION SHOVEL AND CLAMSHELL. 24' boom. 18'-4" dipper handle—1 cu. yd. cast front inserted tooth dipper. 45' boom. Complete clamshell equipment including 1 yard Williams Fav. Clamshell bucket. Air starter. Single shaft cat. Waukesha 4 cylinder 5¾"x8" gas engine. Fair operating condition. Located Eastern Pennsylvania. Box 932-SS.

BUCYRUS-ERIE 30-B STEAM SHOVEL, 21' boom, 14' dipper handle, 1 cu. yd. dipper. With this shovel at sacrifice prices are the following tools and parts, new or useable, amounting to $565 list, including—set of tools (12 pieces), boom tie rod and turnbuckle, 3 cross head gibbs, brake hand, friction band, 16 racking bolts, pair racking bars for dipper handle, main engine crankshaft, hoist cable ¾"x120', pins for cats 1¼"x24", 3 shipper shaft pinions, 2 circle grates, 2 dipper tooth bases, latch plate, 9 dipper teeth, adjusting bolt for cats, 5 handhole plates, anchor pin for friction band, eccentric strap for boom engine, point shaft, 4 cat pads, and slide valve for hoist engine. Located St. Louis, Missouri. Box 817-SS.

BUCYRUS-ERIE MODEL B-2 High Lift Steam Shovel. Caterpillar mounted. Very good working condition. Located South Carolina. Box 644-SS.

BUCYRUS-ERIE GA-2 — Gas-air — high lift shovel. Good operating condition. Located Eastern Pennsylvania. Box 945-SS.

BUCYRUS-ERIE 1030—ELECTRIC TUNNEL SHOVEL. Boom 10 ft. 7 in. Dipper handle 10 ft. 5 in. 1-yd dipper. Boom hoist. 5 ft. 6 in. rear end clearance. 2 motor—power supply 3 phase, 60 cycle, 440 volt. Located Virginia. Box 1068-SS

BUCYRUS-ERIE—D-2 1 yard Diesel Shovel. Atlas engine. Said to be in very good condition. Located South Carolina. Box 1079-SS

BUCYRUS-ERIE GA-2 SHOVEL AND CRANE. 22 ft. 6 in. shovel boom, 16-ft. dipper handle, 1 cu. yd. cast front inserted tooth dipper, 50-ft. box type crane boom. Air starter. Good condition. Located Newark. Box 718-SS.

BUCYRUS-ERIE GA-2 HIGH LIFT SHOVEL. 24' Boom—18'4" Dipper Handle, 1 cubic yard Inserted Tooth Dipper. Also includes Forward Drum and Gearing and mechanism for clamshell operation including 45' boom. Also 1 cubic yard Williams clamshell bucket. Waukesha WS Engine. Good operating condition. Located Chicago. Box 702-SS.

BUCYRUS-ERIE—D-2—1 YARD DIESEL SHOVEL. Atlas engine. Located North Carolina. Bargain price. Box 1021-SS.

MARION 1 CUBIC YARD STEAM SHOVEL. Bargain Price. Box 777-SS.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

OSGOOD — GASOLINE — COMBINATION SHOVEL, CLAMSHELL, AND DRAGLINE equipped with electric starter. Shovel Boom 19'6"—Dipper Handle 14'—Dipper 1 yard standard and 1½ Beet Loading Type. 40' Clamshell and Dragline Boom. Hercules 6 cylinder 85 H.P. engine. Fair condition—good appearance. Located Colorado. Box 1018-SS.

1¼-YARD

BUCYRUS-ERIE GA-2. Machine shop reconditioned, Gas-Air Hi-life shovel. Single shaft cat. 22'-6" boom—16' dipper handle—1¼ cu. yd. dipper. Waukesha 6¾"x8" 4 cylinder engine—brand new cylinders, rings and pistons. Machine in first rlass operatin gand mechanical condition. Available about April 1. Located Chicago. Box 947-SS.

BUCYRUS-ERIE GA-3 SHOVEL. 22'-6" boom. 16' dipper handle. 1¼ cubic yard dipper. Single shaft cat. Waukesha 4 cylinder 6¼x8" gas engine. Reported A-1 condition. Located Washington, D. C. Box 968-SS.

BUCYRUS-ERIE GAS-AIR TYPE GA-2 HIGH LIFT SHOVEL — 22'6" boom — 16' dipper handle—1¼ yard cast front inserted tooth dipper—single shaft caterpillar mounting—electric starter. Excellent condition. Field reconditioned. Waukesha 4-cylinder 6¼"x8" engine — New cylinder blocks and piston rings. Located near Scranton, Pennsylvania. Will demonstrate. Box 508-SS.

BUCYRUS-ERIE GA-2 GAS-AIR SHOVEL. 22'6" boom—16' dipper handle—1¼ yard dipper. Electric starter. Single shaft cat. Very good condition. Located New Hampshire. Box 880-SS.

BUCYRUS-ERIE—41-B—STEAM SHOVEL. 21' Boom—15' Dipper Handle—1¼ yard dipper. Steam operated Dipper Trip. Forward Drum for Clamshell operation, but no boom or bucket. Mass. Boiler. Good operating condition. Located Connecticut. Box 1026-SS.

BUCYRUS-ERIE—GA-3—Latest Model Gas-Air High Lift Shovel. 1¼ yard Dipper. Single Shaft Caterpillar. Wisconsin D-2 engine suitable for 4000' altitude operation. Located San Antonio. Box 1027-SS.

BUCYRUS-ERIE—GA-2 Gas-Air High Lift Shovel. 24-ft. boom, 16-ft. dipper handle, 1¼-yard dipper. Located Virginia. Box 1063-SS

BUCYRUS-ERIE—GA-2 Gas-Air 1¼ yd. shovel. 45' boom clamshell machine. Single Shaft Cat. Recently over-hauled by owner. Located New York. Box 997-SS.

BUCYRUS-ERIE—GA-2 Gas-Air—1¼ high lift shovel. Single Shaft Cat. Electric Starter. Reported good operating condition. Located Eastern Pennsylvania. Box 998-SS.

FOR SALE

Address all box numbers c/o EXCAVATING *at South Milwaukee, Wisconsin*

SMALL SHOVELS
Under 2 Yards continued

BUCYRUS-ERIE—41-B Steam shovel. 1¼ yd. Vanderhoef dipper. Good operating condition. Located near Boston. Box 999-SS.

KOEHRING MODEL 501 1¼ yard gas shovel. Available about August 15. Located New Mexico. Box 879-SS.

LIMA MODEL 101 GAS SHOVEL—21' boom 17' dipper handle—1¼ yard dipper. Located Eastern Pennsylvania. Box 886-SS.

SHOVEL AND DRAGLINE

MARION 450, 1¼ yard electric shovel, 23 ft boom, 16½ ft. handle. Also 45 ft. dragline boom and ¾-yd. dragline bucket. Suitable for 3 phase 60 cycle 2300 volts. Excellent condition. Just the machine for small clay or gravel pit. Located near Chicago. Box 978-SS.

MARION TYPE 32 STEAMER. Shop No. 5676, 18-ft. boom, 15-ft. dipper handle, 1¼-cu. yd. Recently overhauled. Box 451-SS.

MARION — MODEL 450 — Electric 1¼ Yard Shovel. Power—A.C.—D.C.—3 Phase—60 Cycle—440 Volt. Located Eastern Pa. Box 1029-SS.

MARION—450—1¼ Yard Electric Shovel. Also available 2 yard light plate dipper. Good working condition. Located Eastern Pennsylvania. Box 1030-SS.

NORTHWEST—MODEL 104—1¼ yard Gasoline Shovel. Caterpillar treads 24" wide. Overall length 14'8". Twin City 4 cylinder gasoline engine 7¼" by 9". Located Iowa. Box 1031-SS.

NORTHWEST—MODEL 104—1¼ yard Gasoline Shovel. Twin City 4 cylinder 7¼" by 9" engine. Located Eastern Pa. Box 1032-SS.

NORTHWEST MODEL 104 Gasoline Combination Shovel and Dragline. Shovel boom 24 ft., dipper handle 14 ft., dipper 1¼ yd. 45-ft. boom dragline equipment. 24-in. caterpillar treads. Twin City B-D 4-cylinder 7¼ in. by 9 in. Said to be in good condition. Located Nebraska. Box 1066-SS

OSGOOD—HEAVY DUTY—1¼-yard Steam Shovel. Said to be in good working condition. Will sell on terms. Located Virginia. Box 1061-SS

SPEEDER—MODEL 90—Diesel Combination Shovel and Clamshell. 22-ft. shovel boom, 18-ft. dipper handle, 1¼-yard dipper. 50-ft. boom clamshell equipment. Caterpillar Diesel engine. Shovel attachment used very little. Entire machine in excellent condition. Located Boston. Box 1070-SS

1½-YARD

BUCYRUS-ERIE 43-B GASOLINE CHAIN CROWD SHOVEL — 23' boom — 17' dipper handle—1½ cubic yard Vanderhoef dipper and teeth—electric starter—standard single shaft cat. Operated less than six months. Excellent appearance and condition. Will be demonstrated by owner. Located vicinity New York. Box 512-SS.

OSGOOD "VICTOR" 1½ CUBIC YARD SHOVEL AND 50' BOOM CLAMSHELL MACHINE. Gasoline Power. Good operating condition. Located Minneapolis. Box 760-SS.

1¾-YARD

5—MARION MODEL 37, 1¾ yard steam shovels, steel cab. Good working condition. Located Minnesota. Box 825-SS.

MARION MODEL 37 steam shovel. 28'6" boom. 19' dipper handle. 1⅝ yard dipper. Boiler 54"x103½". 165-2" tubes. 145 lb. pressure. Good operating condition. Located Minnesota. Box 986-SS.

MARION MODEL 37. 1¾-yard AC-DC Electric Shovel. Suitable for power supply 3 phase, 60 cycle, 2300 volt. Voltage could be changed to 550. Has had excellent care. Some repairs needed. Located Boston. Box 1062-SS

SMALL DRAGLINES
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B GAS COMBINATION DRAGLINE AND SHOVEL. ⅜-yard drag bucket. Electric starter. Battery lighting equipment. 14-in. caterpillar treads. Approximately one year old. Excellent condition. Located Iowa. Box 1064-SD

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

½-YARD

GENERAL, GAS, 35' boom dragline and shovel, including ½ yd. Esco drag bucket. First class mechanical and operating condition. Located Kansas. Box 993-SD.

¾-YARD

BUCYRUS-ERIE 20-B COMBINATION STEAM DRAGLINE - CLAMSHELL - SHOVEL. Good working condition. Caterpillar Mounted. Located Racine, Wis. Box 701-SD.

SHOVEL AND DRAGLINE

MARION 450, 45 ft. dragline boom and ¾-yd. dragline bucket. Also 1¼ yard electric shovel, 23 ft. boom, 16½ ft. handle. Suitable for 3 phase 60 cycle 2300 volts. Excellent condition. Just the machine for small clay or gravel pit. Located near Chicago. Box 978-SD.

NORTHWEST MODEL 105 GAS—40' boom dragline and clamshell, including Page "C" drag bucket. Climax engine. Reasonably good operating condition. Located Alabama. Box 995-SD.

OSGOOD—40' BOOM GASOLINE DRAGLINE Including ¾ yard "U" Drag Bucket one year old. Fair operating condition. Located Battle Creek, Michigan. Box 1017-SD.

1-YARD

BUCYRUS-ERIE DA-2 DIESEL-AIR 40' BOOM DRAGLINE. No bucket. Atlas Diesel engine. Located Eastern Pennsylvania. Box 872-SD.

BUCYRUS-ERIE—D-2 40-ft. boom Diesel Dragline. 1¼-yard Page Drag Bucket. Atlas engine. Good operating condition. Located Texas. Box 1080-SD

OSGOOD — GASOLINE — COMBINATION DRAGLINE, CLAMSHELL AND SHOVEL equipped with electric starter. 40' dragline and clamshell boom. Shovel boom 19'6"; dipper handle 14'; dipper 1 yard standard and 1½ beet loading type. Fair condition, good appearance. Located Colorado. Box 1018-SD.

1¼-YARD

BUCYRUS-ERIE—D-2—DIESEL DRAGLINE. Atlas engine. Located Texas. 40' Boom, 1¼ yd. Page Bucket. Bargain price. Box 1026-SD.

LORAIN 75-A Gas. 45' boom plus 15' extension, dragline, clamshell, and crane, including 1 yd. "C" Page Drag Bucket—Practically new, and 1 yd. clamshell bucket. Reported very good condition. Located Atlanta, Georgia. Box 1060-SD.

NORTHWEST MODEL 104, Gasoline combination dragline and shovel. 45-ft. boom dragline equipment. Shovel boom 24 ft., dipper handle 14 ft., dipper 1¼-yd. 24-in. caterpillar treads. Twin City B-D 4 cylinder 7¼ by 9 in. Said to be in good condition. Located Nebraska. Box 1066-SD

1½-YARD

TWO P&H 700 DRAGLINES. 1½ cu. yd. buckets on 50' booms. Gas and Diesel. Located Lower Rio Grand Valley, Texas. Box 618-SD.

BUCYRUS-ERIE — 43-B — 1¾ Yard Combination Dragline and Clamshell. Wisconsin 6 cylinder 6" by 7" Gas engine. Located Arizona. Box 1034-SD.

1¾-YARD

BUCYRUS-ERIE 43-B—GAS DRAGLINE. 60 ft. boom made in sections to reduce length. Electric starter. Kohler light plant. Excellent condition. Located Indiana. Box 1081-SD

SMALL CLAMSHELLS AND CRANES
Under 2 Yards

⅜-YARD

BAY CITY "PUP" CLAMSHELL MACHINE. Good operating condition. Box 514-SCC.

½-YARD

BUCYRUS-ERIE 16-B GASOLINE CLAMSHELL. 40' boom. 20" cat treads. Waukesha 6MS, cylinder, 3¾"x4¾" gasoline engine. Approximately one year old. Excellent condition. Located New York. Box 981-SCC.

BYERS-BEARCAT gasoline combination crane, skimmer scoop and back hoe. Williams Clamshell bucket included. Located Eastern Pennsylvania. Box 967-SCC.

¾-YARD

BUCYRUS-ERIE 1030 gasoline clamshell and shovel. 35' clamshell boom and Owen "M" Model 230 clamshell bucket. 23' shovel boom. 15' dipper handle. ¾ yard dipper. Wisconsin B-3 gasoline engine. Cylinder blocks recently rebored. Machine in fair condition. Located Massachusetts. Box 982-SCC.

BUCYRUS-ERIE 20-B COMBINATION STEAM CLAMSHELL—DRAGLINE—SHOVEL. Good working condition. Caterpillar Mounted. Located Racine, Wis. Box 701-SCC.

BUCYRUS-ERIE TYPE B CRANE AND HIGH LIFT STEAM SHOVEL. 42' crane boom. 19'6" shovel boom, 16' dipper handle. ¾ yard dipper. Located Virginia. Box 961-SCC.

BUCYRUS-ERIE TYPE B STEAM COMBINATION clamshell, shovel and steam hoe. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SCC.

FOR SALE

Address all box numbers c/o* EXCAVATING *at South Milwaukee, Wisconsin

BUCYRUS-ERIE TYPE B steam 36' Boom clamshell machine. Located Iowa.
Box 962-SCC

BUCYRUS-ERIE TYPE B steam clamshell and high lift shovel. ¾ yd. 40-ft. clamshell boom including front drum and gearing. Good working condition. Located Eastern Pennsylvania. Low price.
Box 865-SCC

BUCYRUS-ERIE TYPE B, ¾-yard, 40-ft. boom steam clamshell and shovel equipment, including front drum. Caterpillar mounted. Boiler rebuilt 1936. Machinery generally very good condition. Located Chicago.
Box 1072-SCC

NORTHWEST MODEL 105 GAS—40' boom clamshell and dragline, including Page "C" drag bucket. Climax engine. Reasonably good operating condition. Located Alabama.
Box 995-SCC

O & S MODEL "T" ¾ yard clamshell machine. 40' boom. Good working condition. Powered with Climax 5½"x7" gasoline engine. Located near St. Louis. Good working condition.
Box 651-SCC.

1-YARD

BUCYRUS-ERIE GA-2 COMBINATION SHOVEL AND CLAMSHELL. 24' boom, 18'4" dipper handle—1 cu. yd. cast front inserted tooth dipper. 45' boom. Complete clamshell equipment including 1 yard Williams Fav. Clamshell bucket. Air starter. Single shaft cat. Waukesha 4 cylinder 5¾"x8" gas engine. Fair operating condition. Located Eastern Pennsylvania. Box 982-SCC.

BUCYRUS-ERIE — GA-2 — GAS-AIR 45' Boom Clamshell Machine. Good Operating Condition. Located St. Paul, Minn. Box 1024-SCC.

BUCYRUS-ERIE GA-2 CRANE AND SHOVEL. 50-ft. box type crane boom. 22 ft. 6 in. shovel boom, 16-ft. dipper handle, 1 yard cast front inserted tooth dipper. Air starter. Good condition. Located Newark, N. J.
Box 718-SCC

OSGOOD — GASOLINE — COMBINATION CLAMSHELL, DRAGLINE AND SHOVEL, equipped with electric starter. 40' clamshell and dragline boom. Shovel boom 19'6"; dipper handle 14'; dipper 1 yard standard and 1½ beet loading type. Fair condition, good appearance. Located Colorado. Box 1018-SCC.

1¼-YARD

BUCYRUS-ERIE GA-2 clamshell and high lift shovel. Forward drum and gearing and mechanism for clamshell operation including 45-ft. boom. Also 1 cubic yard Williams clamshell bucket. Shovel boom 24-ft., dipper handle 18 ft. 4 in., dipper 1 cubic yard inserted tooth. Waukesha WS engine. Good operating condition. Located Chicago. Box 702-SCC

BUCYRUS-ERIE GA-2 Gas-Air clamshell and shovel. 45-ft. clamshell boom. 1¼-yd. shovel. Single shaft cat. Recently overhauled by owner. Located New York. Box 997-SCC

LORAIN 75-A Gas. 45' boom plus 15' extension, clamshell, crane, and dragline, including 1 yd. clamshell bucket and 1 yd. "C" Page Drag Bucket—practically new. Reported very good condition. Located Atlanta, Georgia.
Box 1000-SCC.

SPEEDER—MODEL 90—Diesel combination clamshell and shovel. 50-ft. clamshell equipment. 22-ft. shovel boom, 16-ft. dipper handle, 1¼-yard dipper. Caterpillar Diesel engine. Shovel attachment used very little. Entire machine in excellent condition. Located Boston. Box 1070-SCC

1½-YARD

OSGOOD "VICTOR" 50' BOOM CLAMSHELL MACHINE AND 1½ CUBIC YARD SHOVEL. Gasoline Power. Good operating condition. Located Minneapolis. Box 760-SCC.

1¾-YARD

BUCYRUS-ERIE — 43-B — 1¾ yard capacity, combination clamshell and dragline. Wisconsin 6 cylinder 6" by 7" Gas engine. Located Arizona. Box 1034-SCC.

LARGE SHOVELS AND DRAGLINES
2 Yards and Over

1½-T MONIGHAN WALKER. Diesel power. 2 yard bucket, 60-foot boom. Good condition. Reasonably priced. Located Kansas.
Box 742-LSD.

BUCYRUS-ERIE 50-B STEAM COMBINATION SHOVEL DRAGLINE. 26' boom, 17' dipper handle, 2 cubic yard dipper, 60' boom dragline equipment including 2 cubic yard Page Class M bucket and steam operated lighting plant. Machine can be placed in operation quickly with installation few small parts. Very attractive price. Located Alabama. Box 842-LSD.

CLASS 320 STEAM DRAGLINE. 144-foot boom, 8-yard bucket. Located on Illinois River. A good buy. Box 750-LSD.

CLASS 14 DIESEL-ELECTRIC DRAGLINE, 70-foot boom, 2-yard bucket. Immediately available. Located near St. Louis. Box 749-LSD.

CLASS 230 STEAM DRAGLINE. 175-foot steel and aluminum boom. 6-yard RED ARCH bucket. Ready to work. Located near New Roads, Louisiana. Box 751-LSD.

BUCYRUS-MONIGHAN 3-W walking dragline. 85' boom, 2½ yard bucket. Located Stovall, Miss. Box 843-LSD.

BUCYRUS-ERIE 50-B, 1¾ yard steam shovel, steel cab, may be inspected. Located Minnesota. Box 827-LSD.

FOR SALE OR RENT

320-B BUCYRUS STEAM DRAGLINE, truck mounted, 165' boom, 6 and 8 cu. yd. Bucyrus-Erie dragline buckets. Also shovel attachment consisting of 100' boom, 52' dipper handles, two 8 cu. yd. dippers (one new). Machine located on Canadian side Detroit River near Detroit; shovel attachment located in Vermont. Both duty paid into Canada. Can work or be shipped anywhere in U. S. or Canada. $10,000 worth spare parts available. Priced right. Box 926-LSD.

PRICE VERY ATTRACTIVE

BUCYRUS-ERIE 50-B STEAM COMBINATION SHOVEL AND DRAGLINE, shop number 10557. 26' boom, 17' dipper handle, 2 yd. dipper, 50' boom dragline equipment, 1⅜ yd. Page bucket. 1 KW 32 volt Moon electric light plant. 54"x9'7" standard coal burning locomotive-type boiler. Also 2 steel under-frame flat cars on which machine is now loaded. New 1929. Moved only 250,000 yards of material. Excellent condition. Price very attractive. Located Kansas City, Mo. Deal direct with owner. Box 900-LSD

2-T MONIGHAN WALKER, 3½ yard bucket. 70 foot boom. Good condition. Reasonably priced. Located Kansas. Box 743-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory.
Box 847-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee, Wis.

CLASS 14 STEAM DRAGLINE, 60' boom. 2 cubic yard Page bucket. Locomotive-type boiler. Thoroughly overhauled and ready for service. Located, Iowa. Box 771-LSD.

TWO 3-W MONIGHAN WALKERS, 3½ yards. 70- and 77-foot booms. Good condition. Reasonably priced. Located Louisiana.
Box 745-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

2-W MONIGHAN WALKER, 2½ yard capacity. 70-foot boom. Good condition. Priced reasonably. Located Louisiana. Box 744-LSD.

BUCYRUS-ERIE 50-B Steam shovel and 45-ft. boom dragline, located Montana. Attractive price. Box 845-LSD.

P&H MODEL 900, 3½ yard Diesel Shovel, 33-foot boom, 200 h.p. Fairbanks-Morse engine. Mounted on caterpillars. Box 828-LSD.

BUCYRUS-MONIGHAN 4-W Walking dragline, 80' boom 5½ yard Page bucket, 30' boom insert and 4-yard bucket. Located Tennessee.
Box 844-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½ yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable, reel and approximately 1400 feet of cable all in excellent condition. Reasonable price.
Box 268-LSD.

FOR SALE OR RENT

CLASS 24 BUCYRUS STEAM DRAGLINE. 125' boom. Skid and roller mounted. Spare parts. Located on Detroit River near Detroit. On Canadian side, duty paid into Canada, but can work or be shipped anywhere in U. S. or Canada. Priced to sell. Box 927-LSD.

ANY FAIR OFFER ACCEPTED

Class 24 steam dragline. 100 foot boom, 5 cubic yard bucket. Skid and roller mounted. Rebuilt 1927 at a cost of $15,000. New locomotive boiler installed 1928. Will accept any fair offer. Located near Fort Worth, Texas. Box 823-LSD.

BUCYRUS-ERIE—50-B—STEAM SHOVEL. 26' Boom—17' Dipper Handle—2 Cubic Yard Dipper. Excellent condition. Located Southern Indiana. Favorable price. Box 1035-LSD.

BUCYRUS-ERIE — 55-B — DIESEL SHOVEL. 27'6" Boom, 18' Dipper Handle, 2½ yard Dipper. Atlas Diesel Engine. New 1935. Excellent mechanical and operating condition. Located Oregon. Box 1036-LSD.

BUCYRUS-ERIE — 52-B — DIESEL SHOVEL AND DRAGLINE. Shovel boom 31'—Dipper Handle 18'—Dipper 2½ yard. Dragline Boom 70'. Drag bucket 2 cubic yard. ¾ K.W. Fairbanks Morse Electric Light Plant. Good condition. Located Eastern Pennsylvania.
Box 1038-LSD.

BUCYRUS-ERIE — 52-B — DIESEL 2¼ yard Shovel. Atlas engine. Good condition. Located Eastern Pa. Box 1039-LSD.

BUCYRUS-ERIE—55-B—DIESEL DRAGLINE. 90' Boom. 3 yard Drag Bucket. Atlas Engine. Excellent condition. Located Eastern Pennsylvania. Box 1040-LSD.

BUCYRUS-ERIE — 100-B — STEAM SHOVEL. 3 yard Dipper. Revolving machinery, very good condition. Located Montreal, Canada.
Box 1041-LSD.

FOR SALE

Address all box numbers c/o EXCAVATING *at South Milwaukee, Wisconsin*

LARGE SHOVELS AND DRAGLINES
2 Yards and Over continued

BUCYRUS-ERIE—120-B—ELECTRIC 4 YARD SHOVEL. Power Equipment—3 Phase—60 cycle — 2300 volt — Induction Ward-Leonard Control. Good operating condition. Located Eastern Pennsylvania. Box 1042-LSD.

BUCYRUS-ERIE—CLASS 111. 3 yard Dragline. 70' Boom with 10' extension. Atlas 6 cylinder 9" by 10½" engine. 1½ K.W. Kohler Light Plant. Excellent Condition. Located Oregon. Box 1043-LSD.

BUCYRUS-MONIGHAN—MODEL 1½ T. 2 Yard Diesel Dragline. 60' Boom. 75 H.P. Fairbanks-Morse Engine. Fairly good mechanical condition. Owner will sell on terms. Located Mississippi. Box 1044-LSD.

BUCYRUS-MONIGHAN—MODEL 4-T—4 Yard Diesel Dragline. 100' Boom. Located Southern Illinois. Box 1045-LSD.

BUCYRUS-MONIGHAN—MODEL 4-W—Diesel Dragline. 4½ yard Light Weight Bucket. 110' Boom. Good Condition. Located near New Orleans, La. Box 1046-LSD.

BUCYRUS-MONIGHAN—MODEL 4-W—4 yard Diesel Dragline. 110' Boom. Good Condition. Located Nebraska. Box 1047-LSD.

BUCYRUS-MONIGHAN — SPECIAL MODEL 6160—9 yard Diesel Dragline. 160' Boom. Fairbanks-Morse Type 32-D-14—5 cylinder engine. 350 HP. Seen little service. Excellent condition. Located Nebraska. Box 1048-LSD.

MARION—MODEL 350—8 yard Electric Shovel. Power equipment, 3 Phase, 60 cycle, 2300 volt—Ward-Leonard Control. Mounted on railway trucks. Good condition. Located Minnesota. Box 1049-LSD.

MARION—MODEL 70—3½ yard Electric Shovel. Railway truck mounted. Power Equipment, 3 Phase, 60 cycle, 2300 volt. Good condition. Located Ohio. Box 1050-LSD.

PAGE—MODEL 220—2½ yard Diesel Dragline. 85' Boom. Page 2 cylinder 13" by 20"—160 HP. engine. 850 watt Delco Light Plant. Recently overhauled, including engine. Good operating condition. Bucket practically new. Located Iowa. Box 1052-LSD.

P&H—MODEL 900 3 yard Diesel Dragline. 110' Boom. Fairbanks-Morse 5 cylinder 10¼" by 12½" Diesel engine. 1500 watt Kohler Light Plant. Recently rebuilt. Excellent condition. Located Eastern Pennsylvania. Box 1053-LSD.

BUCYRUS-MONIGHAN 3-T DIESEL DRAGLINE. 80-ft. steel boom. 3 cu. yd. drag bucket. 120 h.p. Fairbanks-Morse type "YVA" engine. 1500 watt Kohler light plant. Said to be in good condition and located Mississippi River near New Orleans. Can be loaded directly on barge at present location. Box 1056-LSD

BUCYRUS-ERIE—75-B Electric Combination Shovel and Dragline. 29-ft. shovel boom, 20-ft. dipper handle, 2½-yard dipper. 85-ft. dragline boom with mast suspension. Suitable for power supply, 3 phase, 60 cycle, 2300 volt. Induction motors. Said to be in excellent working condition. Located Eastern Pennsylvania. Box 1058-LSD

BUCYRUS-ERIE 50-B—2-yard Steam Shovel. Located Texas. Low Price. Box 1059-LSD

BUCYRUS-ERIE 50-B DIESEL DRAGLINE. 50-ft. boom plus 10-ft. extension. 1½-KW Kohler light plant. Atlas 4-cylinder 9 in. by 12 in. engine. Reported good condition. Located Nebraska. Box 1067-LSD

BUCYRUS-ERIE 55-B—Extra High Lift Diesel Shovel. 35-ft. boom. 22-ft. dipper handle, 2 cu. yd. Bowl Door dipper. Caterpillar mounted. Kohler light plant. Atlas Diesel engine. Used about three months. Just like new. Located Kentucky. Box 1069-LSD

BUCYRUS-ERIE—CLASS 24 DIESEL DRAGLINE. 130-ft. boom, 4 cu. yd. bucket. Truck mounted. 165 h.p. Anderson Diesel engine. Friction drive. Said to be in good operating condition. Located on Mississippi River near New Orleans convenient for loading on barge. Box 1074-LSD

LOCOMOTIVES

LOCOMOTIVE

BALDWIN, 17x24 straight drive standard gauge 45 ton locomotive. 54 inch boiler. Shop number 38962. Has passed State Boiler Inspection yearly. Boiler will stand cold water test of 240 lbs. At present in actual service in Minnesota mine. Box 152-ME.

MISCELLANEOUS EQUIPMENT

TUNNEL EQUIPMENT

The District Engineer, U. S. Engineer Office, Fort Peck, Montana, has for sale many items of equipment used in the construction of four miles of tunnels. Persons interested in the purchase of this class of equipment are requested to contact the above office for further information.

DRAGLINE EQUIPMENT

72-ft. Dragline Boom and Fairlead—Hydraulic Equipment—1 Hoist Drum—1 Drag Drum—1 Boom Suspension, Sway Brace and Suspension Cables. All suitable for application to Bucyrus-Erie Model 75-B Machine. Located Eastern Pennsylvania. Box 1060-ME

PRICED TO SELL

1—ONE-YARD USED ALL-CAST DIPPER. Will fit Bucyrus-Erie B-2 and GA-2 machines. Located New York City. Has seen very little Service. A good buy. Box 1055-ME.

Tunnel Equipment For Sale

Tunnel excavating equipment, ventilating equipment, concrete equipment, gravel plant, drag lines, electrical equipment, camp equipment and a large variety of small tools and supplies. All used on completed Colorado River Acqueduct contract.
BRODERICK & GORDON, Indio, Calif.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

PARTS—175-B Shovel—PARTS

1 Boom
1 Dipper Shaft
1 Six Yard Dipper

If interested in making a good buy on these shovel parts, write us. Box 607-ME.

GENERAL ELECTRIC, SHOVEL MOTOR GENERATOR SET consisting of: synchronous motor, 250 h.p., 3 phase, 60 cycle; one automatic transformer, less starting equipment; hoist generator; swing generator; crowd generator; exciter M. G. set, 3 phase, 60 cycle, 440 volts; exciter generator. All units have anti-friction bearings. Very good condition, ready to use. Located Michigan; available after June 1. Box 1007-ME

THREE JORDAN SPREADERS, all in excellent working condition. Two of these machines located near the Twin Cities and other near St. Louis. All available for immediate shipment and priced to sell. Box 1008-ME

HAISS EXCAVATOR—C7097, June 1930. Weight 11 tons. Needs new teeth. 32" per minute crowding. Price, $1800. Box 990-ME.

TUNNEL EQUIPMENT

2 Type 20 Conway Mucking Machines.
5 I-R L-74 Water Liners.
24" Gauge Track, switches and dump cars.
16" Blower and Ventube.
Air Compressors, pipe line, etc.
All priced very reasonably.
Southern-Arsenal Public Relief Sewer Project of Fruin-Colnon Contracting Co., Foot of President Street, St. Louis, Missouri.

2 EUCLID WAGONS. Bargain price. Located Detroit. Box 1062-ME

NO. 44 BARBER-GREENE DITCHER in good condition. Located near Polo, Illinois. Box 824-ME

SHOVEL FRONT ENDS

ONE COMPLETE 52-B DIESEL SHOVEL FRONT END. Consists of boom, dipper handle and 2¼ cu. yd. dipper.
TWO COMPLETE 52-B ELECTRIC SHOVEL FRONT ENDS. Consist of Booms, dipper handles and 2¼ cu. yd. dippers. Motors on booms are 3-phase, 60 cycle, 2300 volt current. Box 741-ME.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

SHOVEL FRONT ENDS

1½ cu. yd. shovel front end—new dipper—for Marion 32 steamer. Priced right. Located near Chicago. Box 857-ME.

MINING AND QUARRY EQUIPMENT

The following equipment is located in Minnesota. Full details on request.

3—Boilers.
12—36" gauge Koppel double truck flat cars.
6—36" gauge Peteler 4-yard two way dump cars.
4—Swing & Boom engines for Marion 31 & 36 shovels.
1—Austin-Western grader, 8' blade & scarifier.
4—Hoists—Single and double drum.
2—Milwaukee gasoline locomotives, 7-ton 24" gauge.
3—Electric motors, 100 to 150 h.p.
8—Pumps—Steam and gasoline.
1—Special Twin City Tractor.
1—Complete Ainley Placer gold machine.

Box 833-ME.

BUCYRUS 20-B STEAM PARTS

Combination crane and shovel, located Binghamton, N. Y. Subject to lot sale.
46—Caterpillar 24" treads.
4—Conical rollers.
1—Roller path gear.
1—Boom hoisting engine.
1—Swing engine.
1—35' crane boom (flat).
1—18' shovel boom with engine, 12' dipper stick with 8'6" travel, ¾ yd. dipper with teeth.

Box 1054-ME.

EXCAVATING Bargain Counter

EVERY item on this page is priced for QUICK SALE. The equipment offered includes SURPLUS STOCK, REBUILT (carrying new equipment guarantee), and USED. Write or wire EXCAVATING, mentioning reference number. SAVE by filling your requirements from the BARGAIN COUNTER.

COMPLETE FRONT END EQUIPMENT

SHOVEL EQUIPMENT

¾ yd. dipper—25'9" boom—14' handle—30-B Diesel. New. SE-17.

1¾ yd. dipper, 30' boom, 19' handle, high lift steam 50-B. New. SE-33.

1¾ yd. dipper, 22' boom, 16' handle, 43-B. New. SE-34.

SKIMMER SCOOP

¾ yd. dipper—20' boom with ropes and material to convert 1020 shovel, clamshell or dragline to skimmer scoop. New. SS-1.

DRAGLINE EQUIPMENT

40' channel boom, fairlead and ropes. D-2—20-B—31-B. Used. DL-3.

TRENCH DIGGING EQUIPMENT

1 yd. 42½" wide, dipper, 24' boom and auxiliary equipment. Will dig depth 22'. For GA-2 or GA-3 shovel. Rebuilt—new machine guarantee. DS-5.

New Page, two dippers each ¾ cu. yd., 17'1½" boom and auxiliary equipment. Will fit 1030 or 1035. DS-7.

1 yd. 42½" wide dipper, 24' boom and auxiliary equipment—will dig depth of 22'. For GA-2 or GA-3 clamshell or dragline. Rebuilt—new machine guarantee. DS-8.

BOOMS

15'0" 1030 chain crowd. Used. JA-32.
*15' 20-B steam shovel. New. JA-2.
18' 31-B steam shovel. New. JA-3.
20'0" 1020 rope crowd. New. JA-23.
20'0" 1030 chain crowd. New. JA-24.
*20'6" 20-B steam shovel. New. JA-4.
21'6" 37-B chain crowd. New. JA-26.
21'9" 31-B steam shovel. New. JA-5.
*22'0" 43-B chain crowd. Used. JA-27.
*23' 20-B diesel, gas or electric shovel. New. JA-7.
23'6" 37-B rope crowd. New. JA-28.
24'0" 43-B rope crowd. New. JA-29.
24'0" GA-2 drag shovel. New. JA-30.
24'0" GA-2 drag shovel. Used. JA-34.
24'0" GA-3 drag shovel. New. JA-35.
24' GA-2 or GA-3 shovel. New. JA-8.
*24' 43-B rope crowd. New. JA-9.
25'9" 30-B diesel shovel. New. JA-10.
*26' D-2 shovel boom. New. JA-13.
26' 50-B steam shovel. New. JA-15.
*27' 43-B rope crowd. New. JA-16.
27'0" 43-B rope crowd. New. JA-31.
*30' 50-B steam shovel. New. JA-18.
40' 20-B, 31-B and D-2 dragline boom. Used. JA-20.

Asterisk (*) denotes more than one such item available.

DIPPER HANDLES

7'6" 1030 Tunnel (two sticks). New. H-1.
7'10½" 20-B Tunnel (two sticks). New. H-2.
9'0" 31-B Tunnel (two sticks). New. H-3.
*9'0" 30-B Tunnel (two sticks). New. H-4.
9'6" 20-B Tunnel (two sticks). New. H-5.
9'6" 31-B Tunnel (two sticks). New. H-6.
12'0" 18-B—Complete. New. H-7.
12'6" D-2, 31-B—Complete. New. H-8.
12'6" D-2, 31-B—Complete. New. H-9.
*15'0" E-2, 41-B—Complete. New. H-13.
16'0" Type "A"—Complete. New. H-16.
19'6"—37-B—Complete. New. H-25.

DIPPERS

SMALL MACHINES

*½ yd. Plate front. Will fit 1020 drag shovel. New. D-45.
⅝ yd. Plate front, 20-B. New. D-12.
2/3 yd. Plate front, 14-B. New. D-13.
¾ yd. Rock type, 20-B. New. D-67.
⅞ yd. Ins. tooth, 1030. New. D-47.
1 yd. Plate front, 20-B. New. D-42.
1 yd. Rock type, 1030 tunnel. New. D-50.
*1¼ yd. Ins. tooth, 30-B, 41-B, 12-B, E-2. New. D-44.
1¼ yd. Rock type, 30-B, 41-B, 12-B, E-2. Used. D-27.
1½ yd. Ins. tooth, 42-B, 43-B. New. D-55.
*1¾ yd. Ins. tooth, 43-B. New. D-58.
1 yd. Dipper, 30-B. D-68.

LARGE MACHINES

2 yd. Manganese, 43-B. New. D-62.
3½ yd. 2¾" front, two part teeth, 88-C, 95-C, class 80 Atlantic. New. D-3.
4 yd. 2¾" front, two part teeth, 100-C, 120-B. Used. D-4.
6 yd. Two part teeth, 200-B, 225-B and 320-B. New. D-11.
8 yd. Two part teeth, 320-B. Used. D-6.

BUCKETS

DRAGLINE

*½ yd. Beco "U". 1100 lbs. New. DB-33.
*1 yd. Beco "U". 2000 lbs. New. DB-34.
1¾ yd. Beco "U". 3250 lbs. New. DB-35.
*2 yd. Page "C". 5630 lbs. New. DB-4.
*2 yd. Beco Heavy. 5400 lbs. New. DB-24.
2½ yd. Beco Heavy. 6500 lbs. Rebuilt. DB-9.
2½ yd. Omaha. 5400 lbs. Rebuilt. DB-10.
6 yd. Monighan "W". 12500 lbs. New. DB-17.
7 Yd. Monighan "W". 13700 lbs. New. DB-18.

CLAMSHELL

2 yd. PF Williams clamshell bucket without teeth and counterweight. CSB-1.

Asterisk (*) denotes more than one such item available.

DIPPER TRIPS

31-B steam dipper trip. New. DT-2
*50-B steam dipper trips. New. DT-4.

Asterisk (*) denotes more than one such item available.

ELECTRICAL EQUIPMENT

90 H.P. motor, G.E., 3 phase, 25 cycle, 550 volt, 1500 R.P.M. New. EE-1.

TANKS

WATER

*260 gallon 41⅞"x21"x6'4". No. 14 BW gauge steel plate. T-1.
*200 gallon 36½"x20⅛"x6'8" high. Elliptical—¼" steel plates. T-2.
283 gallon 54⅝"x17⅜"x6'4". ¼" steel plates. T-3.

OIL

*60 gallon 11½"x18"x77" elliptical blue annealed copper alloy smooth plate. T-4
*25 gallon 47¼" dia. 14" deep—12 gauge std. blue annealed copper alloy steel. T-5.
294 gallon 48"x21¼"x6'4". ¼" steel plates. T-6.
*50 gallon 60" dia. x 12" deep—No. 12 gauge std. blue annealed copper alloy. T-7.

GASOLINE

*55 gallon 30"x18½"x23½" 16 gauge— U.S.S. Terne metal, (copper brased or soldered). T-9.

AIR

*5 cu. ft. 16" dia. x 48" high—225 lb. working pressure A.S.M.E. std. Tested to 340 lb. cold water test. T-10.
14 cu. ft. 21½" dia. x 77" high. 200 lb. working pressure. Will pass inspection in Massachusetts and any Canadian Province. T-12.
*16 cu. ft. 22⅝" dia. 77" high. 200 lb. working pressure A.S.M.E. std. T-13.
*Air tanks 16" I.D. by 4'4" high 200 lbs. working pressure ASME standard tested to 350 pounds cold water test, Drawing 189701. T-14.

ENGINES

DIESEL

*140 H.P. new, non-reversible Atlas Diesel engines—8 cylinder, 9" bore x 10½" stroke, 514 R.P.M. DE-2.

STEAM

12½"x16" link reversing. ME-1.

BOILERS

46½"x110", 32 H.P. vertical. 155 lb. working pressure. Special wood burning fire box. A.S.M.E. std. Will fit any B-2 or B-3. B-9.

44"x17', 75 H.P. locomotive. 125 lb. working pressure. A.S.M.E. std. Will fit 68-C. B-13.

AIR COMPRESSORS

Brand new Worthington-Metalweld—2-cylinder 7"x6" vertical 162 cu. ft. air compressor. AC-3.
*11"x11"x12" steam—locomotive type—Westinghouse. New. AC-1.
11"x11"x12" steam—locomotive type—Westinghouse. Used. AC-2.

Asterisk (*) denotes more than one such item available.

EXCAVATING
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with
Bulldog Rope Sockets

BULLDOG Wedge Rope Sockets never let go! The rope pulls the wedge tightly into the tapered socket . . . and the harder the pull, the tighter the grip. The rope always pulls directly in line with the point of attachment. Get Bulldog savings on your job.

BUCYRUS-ERIE

BUCYRUS ERIE

EXCAVATING, DRILLING & MATERIAL-HANDLING EQUIPMENT • • SOUTH MILWAUKEE, WIS.

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

When RESULTS are Needed

Specify— INTERNATIONAL POWER

Six International TracTracTors were used in the construction of the new $3,000,000 Portland, Ore., airport. This shows one of the two Diesel-powered TracTracTors pulling a 6-yard carry scraper. The four other units were gasoline-powered and did the bulldozing. Some 4,600,000 yards were dredge fill and an additional 2,000,000 yards were moved by these Internationals in leveling operations.

An International PD-80 six-cylinder Diesel Power Unit at work on a big crusher plant near Maupin, Ore.

LET this sound advice from *experienced* users direct your purchases of industrial tractors and power units. Cash in on the advantages INTERNATIONAL *Performance* and INTERNATIONAL *Economy* bring to the job—advantages that make you feel mighty good when the cost sheets are figured.

International Industrial Power has a reputation for getting things done fast . . . that's why you find the *big* jobs being turned over to International. And when service is needed, the low maintenance cost of each unit in the International line means amazing savings. Wheel and crawler tractors (gasoline and Diesel) for mobile power, and power units (gasoline and Diesel) ranging up to 110 max. h. p. for stationary work are available. See the nearby International industrial dealer or Company-owned branch for complete information.

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
606 So. Michigan Ave. Chicago, Illinois

INTERNATIONAL Industrial Power

For your convenience in writing to International Harvester Company, you will find a card bound in this issue.

Trade Notes

The Seattle office of **Bucyrus-Erie Company**, South Milwaukee, Wisconsin, is now located at 3408 1st Avenue, South, Seattle, Washington.

Bucyrus-Erie has also appointed **James W. Bell**, Cedar Rapids, Iowa, as its new distributor in that territory. The James W. Bell Company will cover the majority of the state of Iowa except for the extreme western area, and will carry the smaller machines in the Bucyrus-Erie line as well as a stock of repair parts.

F. H. Hopkins & Co., Ltd., distributors for Bucyrus-Erie Company, South Milwaukee, Wis., announce their location in new quarters at 340 Canada Cement Bldg., Phillips Square, Montreal, Quebec, Canada.

Ransome Concrete Machinery Co., of Dunellen, N. J., announces the appointment of the following firms to handle their line of concrete mixing and handling equipment: Brown-Strauss Corp., Kansas City, Mo.; Shovel Supply Co., Dallas, Texas; Highway Equipment Company, Cincinnati, Ohio; Contractors Machinery & Supply Co., Chattanooga, Tenn.; Dakota Tractor & Equipment Co., Fargo, N. D.; H. B. Faith Equipment Co., Rockford, Ill.

W. C. Slee was recently appointed Assistant Engineer-Director of the American Road Builders' Association, Washington, D. C.

W. D. Ball, 600½ W. Madison St., Ottawa, Ill., recently has become associated with the **Tractor & Equipment Co.**, Chicago, Ill., as District Representative in LaSalle and adjoining counties.

Two appointments to the sales staff of its New York Office, 330 West 42nd Street, are announced by **The Lincoln Electric Company**, Cleveland, Ohio.

The men appointed are **W. H. Borst**, graduate in mechanical engineering from the University of Illinois, and **E. A. Webber**, formerly with the company's Chicago office. The new men will assist G. N. Bull, manager, and F. H. Andrews, S. G. Morris and J. B. Chamberlain, members of the New York office staff in providing welding consultation service on all phases of welding.

The C. R. Jahn Company announces that their trailers are now being manufactured in Chicago and no longer at La Crosse, Wis. The central location of Chicago makes possible much lower freight rates and prompter delivery. The new location is Builders Building, Chicago.

A. W. Benn has been appointed sales manager in the new St. Louis territory of the Harnischfeger Corporation. He will handle the sales of the **P&H** Hansen Smootharc Welders and the new Smootharc Welding Rod. Mr. Benn was formerly connected with the Keasbe-Mattison Company.

FOR SALE

RATES

60c per line—minimum charge $2.40. Repeat insertions with no change in copy—three insertions for the price of two.
Display advertising in this section at published display advertising rates.
Estimate 41 characters per line, counting all spaces and punctuation as one character each. Allow ten characters for box number for blind advertisements. If address given, counts same as advertising copy.
Rates are net (no commission, no discount) and payable in advance of publication. Send your remittance with insertion order and copy.

Address all box numbers c/o* EXCAVATING *at South Milwaukee, Wisconsin

SMALL SHOVELS
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B GAS Combination Shovel and Dragline. Electric Starter. Battery lighting equipment, ⅜-yard drag bucket. 14-in. caterpillar treads. Approximately one year old. Excellent condition. Located Iowa. Box 1064-SS

BUCYRUS-ERIE 10-B standard gas shovel. 1½ years old. Good condition. Located Eastern Pennsylvania. Box 991-SS.

BUCYRUS-ERIE 10-B TRAILER—Traveled less than 100 miles. Good as new. Bargain price. Box 1078-SS

BUCYRUS-ERIE TRAILER for 10-B machine, less than year old. Excellent condition. Located Western Pa. Bargain price. Box 1001-SS.

INSLEY — TYPE C — GASOLINE SHOVEL. Engine recently rebored and reconditioned. Machine generally in good operating and mechanical condition. Equipped with Buda type KTU Diesel engine. Located Arkansas. Box 814-SS.

½-YARD

BUCYRUS-ERIE 16-B GAS SHOVEL. 16'-6" boom—12'-6" dipper handle—½ cu. yd. cast front inserted tooth dipper. Waukesha 6 cylinder 8¾"x4¾" gasoline engine. Excellent condition. Will demonstrate. Located western New York State. Box 930-SS

BUCYRUS-ERIE 1020 gas shovel and dragshovel. 18' shovel boom. 13' shovel dipper handle, ½ yard shovel dipper. Dragshovel equipment ½ yard front opening type of dipper. Electric starter. Waukesha DR 4 cylinder gas engine. Reported in good operating condition. Located Rhode Island. Box 956-SS.

BUCYRUS-ERIE 16-B COMBINATION ½ yd. shovel and drag shovel. Used as shovel three days—as drag shovel five weeks. Practically new condition. Located Eastern Pennsylvania. Box 992-SS.

BUCYRUS-ERIE 1020 Gasoline Positive Crowd Shovel. 18-ft. boom, 13-ft. dipper handle, ½-yard dipper. Waukesha D.R. 4-cylinder engine. Fair condition. Will demonstrate. Located Western New York state. Box 1073-SS

GENERAL GAS SHOVEL and 35' boom dragline including ½ yd. Esco drag bucket. First class mechanical and operating condition. Located Kansas. Box 993-SS.

P & H MODEL 204 GAS combination ½ yd. shovel and 42' boom crane. Waukesha 4 cylinder 5"x6¼" engine. Good condition considering age. Located San Francisco. Box 1005-SS.

⅝-YARD

BUCYRUS-ERIE Type A steam shovel. 16' boom. 12'-6" dipper handle. ⅝ yard shallow cut dipper. Two speed propelling mechanism. Hand operated boom hoist. Located vicinity New York. Box 958-SS.

SPEEDER — MODEL B-3 — GAS SHOVEL equipped with ⅝ yard Dipper. Located near Boston. Box 1012-SS.

¾-YARD

AMERICAN STEAM SHOVEL. Oil burning. Caterpillar mounted. Main machinery and boiler very good. Balance of machinery needs some repairs. Located Arkansas. Box 965-SS.

BUCYRUS-ERIE TYPE B high lift steam shovel and crane. 19'-6" shovel boom. 16' dipper handle. ¾ yard dipper. 42' crane boom. Located Virginia. Box 961-SS.

BUCYRUS-ERIE TYPE B steam shovel. High lift. Boiler reported good condition and machinery generally in fair condition. Located Rockford, Illinois. Box 963-SS.

If You Do Not Find What You Want Listed—Write Us

EXCAVATING
South Milwaukee, Wis.

BUCYRUS-ERIE TYPE B STEAM COMBINATION SHOVEL-CLAMSHELL AND STEAM HOE. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SS.

BUCYRUS-ERIE (2) TYPE "B" HIGH LIFT Caterpillar mounted Steam Shovels. Good operating condition. Located Eastern Pennsylvania. Box 1014-SS.

BUCYRUS-ERIE TYPE B Steam shovel, caterpillar mounted. Located Indiana. Box 983-SS.

BUCYRUS-ERIE 20-B COMBINATION STEAM SHOVEL - CLAMSHELL - DRAGLINE. Good working condition. Caterpillar mounted. Located Racine, Wis. Box 701-SS.

BUCYRUS-ERIE TYPE B STANDARD ¾ YARD STEAM SHOVEL—Quarry type Dipper — Caterpillar mounted. Good operating condition. Located Georgia. Box 752-SS.

TYPE B BUCYRUS-ERIE HIGH LIFT STEAM SHOVEL 21'3" boom, 18'4" dipper handle. ¾ cubic yard inserted Tooth Dipper—Power Boom Hoist—Boiler Feed Pump—Caterpillar mounted. Located Chicago. Box 699-SS.

BUCYRUS-ERIE MODEL 1030 gasoline shovel. 20'-6" boom, 13'-6" dipper handle, ⅞ cubic yard dipper. Reported good condition. Located Minnesota. Box 964-SS.